VETERINARY MEDICINE

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Animal Ringworm Study†

ROBERT W. MENGES, D.V.M. and LUCILLE K. GEORG, Ph.D.,
Atlanta, Georgia

THE purpose of studying ringworm in animals is to determine which fungi are the common causes of ringworm in animals; to obtain data concerning the epizootiology of ringworm; to ascertain the role of animals in the epidemiology of human ringworm; and finally, to develop methods of control to prevent the spread of infection from animals to man.

Most of these objectives can be achieved by surveying animals in various parts of the United States. Recently such a program was started in the laboratories of the Communicable Disease Center. Hair specimens are received in special envelopes provided for this purpose (fig. 1). Any veterinarian in the United States may obtain these envelopes, and send specimens directly to the Mycology Laboratory, U. S. Public Health Service, Communicable Disease Center, P. O. Box 185, Chamblee, Ga.

The day hair specimens are received at the laboratory they are examined with the Wood's Lamp for fluorescence, and studied microscopically for the presence of fungus elements. A preliminary report of the results is prepared and forwarded to the veterinarian (fig. 3). After the specimen is cultured and the etiologic agent isolated, a final report (fig. 4) is mailed. When the specimen is negative, the report is sent out at the end of one month.

It is well to mention that the number of positive microscopic preparations and cultures is directly proportional to the care taken in selecting hairs and skin scrapings. The best for examination are the lusterless, broken hairs which can be epilated easily, or hairs covered with crusts and centered in pustules. Hairs from the edges of lesions are also suitable for examination. When dealing with ringworm in cattle, the hard crust of the lesions should be removed and the hair stubs lying beneath scraped off and placed in the mailing envelope.

If a Wood's lamp (an ultraviolet light with a special nickel-oxide filter which allows maximum radiation at about 3,660 angstrum units) is available, examine dogs and cats in a completely darkened room. If fluorescing hairs are seen (hairs which glow a bright yellow-green), either scrape off or pluck out these hairs. Sterile scalpels or sterile forceps should be used to obtain specimens.. If the hair does not fluoresce, the animal may still have ringworm, since only two organisms produce fluorescence — *Microsporum canis* and *M. audouini* (rare in animals). It has been found that even when infected by *M. canis*, a large percentage of the animal hairs do not fluoresce.

Direct microscopic examination is carried out by placing hairs in a drop of 10% potassium hydroxide on a glass slide, adding a coverslip and allowing the slide to stand 15 to 20 minutes before examination (heating the slide short of boiling hastens clearing). If positive, chains of spores covering the surface

†From the Communicable Disease Center, Public Health Service, United States Department of Health, Education and Welfare.

of the hairs will be seen. Whether the microscopic examination is positive or negative the specimen should be cultured since the only way to definitely determine whether an animal does or does not have ringworm is to obtain cultures of the causative fungus agent.

FORM APPROVED
BUDGET BUREAU NO. 68-R535

SPECIMEN DATA FOR ANIMAL RINGWORM STUDY

No._____

CHECK PROPER DATA

ANIMAL: Dog, Cat, Horse, Cow, Sheep, Swine, Chicken, Other_____.

AGE:_____ SEX: Male ☐, Female ☐.

BREED:_____

TYPE LESIONS: Scaling ☐, Vesicular ☐, Erythema ☐, Circular ☐, Suppurative ☐, Kerion formation ☐, Eczematoid ☐.

LOCATION OF LESIONS: Head ☐, Neck ☐, Shoulder ☐, Flank ☐, Back ☐, Abdomen ☐, Leg ☐.

DOES OWNER OR OWNER'S FAMILY HAVE SKIN LESIONS? Yes ☐ No ☐.

DOES ANY EMPLOYEE OF THE FAMILY HAVE SKIN LESIONS? Yes ☐ No ☐.

OWNER'S NAME & ADDRESS _____

VETERINARIAN: _____

Date: _____

PHS 300-229 (CDC) GA(
11-53

Fig. 1. The face of envelope for animal ringworm surveys.

Animals with ringworm may or may not have obvious lesions. Cats especially, may show only minimal lesions. Therefore, when investigating human cases of ringworm, it is important to obtain hair specimens from all animal contacts regardless of the absence of obvious signs of infection.

The lesions commonly observed in cases of ringworm are circular, and scaling. The central portion of the lesion is usually free of hair, and erythema may be observed. Occasionally the lesions may be vesicular, eczematoid, or suppurative. Kerion formation may occur. Kerions are lesions characterized by the development of large, boggy masses which rise abruptly from the surrounding tissue. They are red in color and are dotted over with perifollicular abscesses. The hairs in these follicles are either lusterless and broken or are shed completely leaving gaping holes containing purulent fluid. The neighboring lymph nodes usually are enlarged. Secondary allergic manifestations may occur in the form of a papular rash known as a trichophytid or microsporid.

Lesions commonly are found on the head of the animal, but they may occur at almost any location. In the following paragraphs the common location of lesions is given for various animals.

Cat. Almost invariably the head is affected, hairs on the bridge of the nose, on the cheeks and inside and along the margin of the ears being most frequently involved; in kittens a small amount of facial mottling is the only sign that betrays infection before the Wood's lamp provides confirmation. The hairs on the abdomen and back often are infected and even in a few cases those of the paws and tail.

Cattle. The most frequent site of infection is the head, especially the skin and hair of the face, above the muzzle, around the eyes and at the base of the ears; but other parts of the body surface may be affected.

Dog. The lesions appear most commonly on the head and legs. Infrequently lesions develop on the abdomen, shoulder, neck, back, and flank.

Horse. The initial site of infection in race horses is usually in those areas of the back where the skin has been abraded. The back, flanks, and croup, areas rubbed by the saddle and saddle girth are the most common sites. Infection may spread and include the head, neck, and legs. Slight roughness of the hair and nodules on the skin are the first indications of infection. The infected skin becomes

desquamated with the formation of small grayish scales.

Chinchilla. The first lesions usually appear on the nose and around the anus; areas where the skin is generally moist. The tendency of animals to rub noses is considered to be a factor in the spread of the disease from animal to animal. In most cases the condition remains

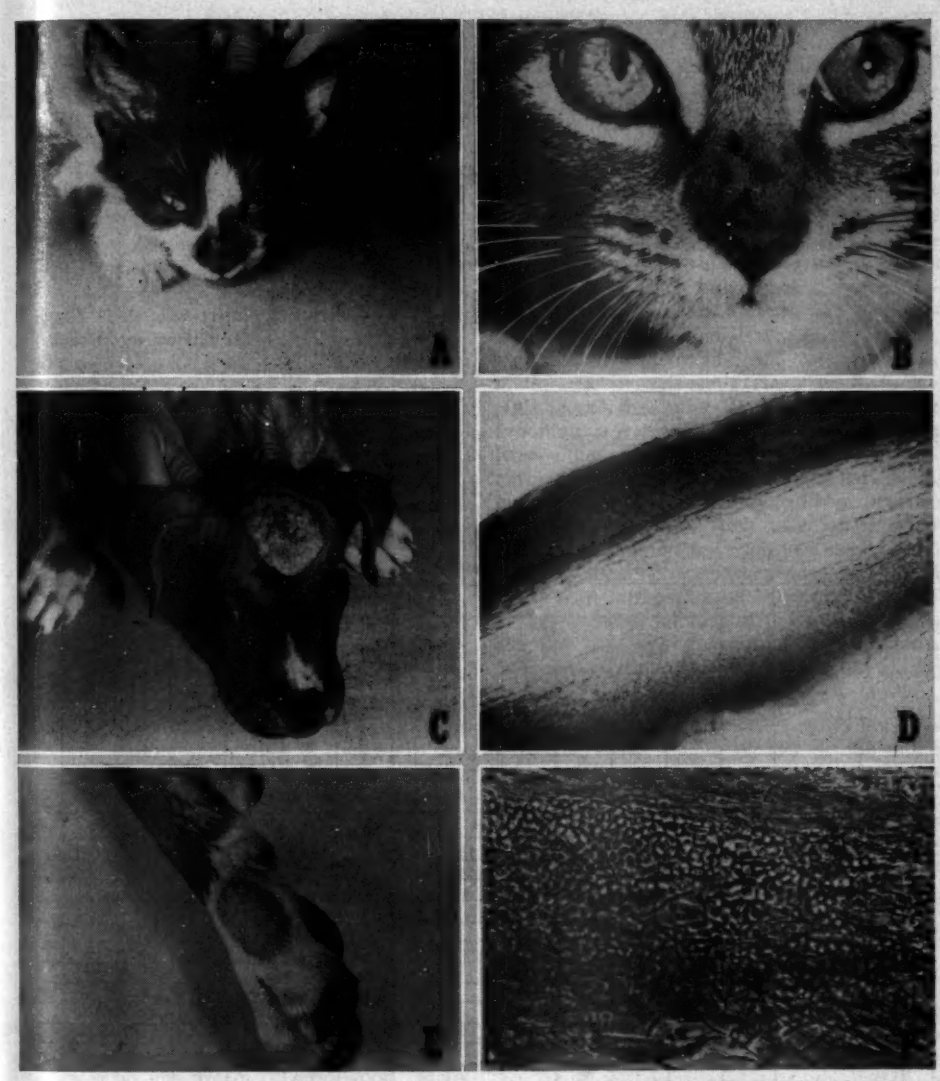

Fig. 2. (A) Microsporum canis infection in a kitten. Loss or hair on nose and edges of ears, and generalized scaling were the only visible signs of disease.

(B) Microsporum canis infection in an adult cat. Areas of hair loss on nose (dark spots) were the only visible signs of disease.

(C) Microsporum canis infection in a dog. Clearly defined areas of alopecia and scaling are seen on top of the head and on the right upper lip.

(D) Hair infected by Microsporum canis. Shows sheath of small spores in mosaic.

(E) Microsporum gypseum infection in a dog. Solitary lesion on the foot shows a clearly defined area of scaling and hair loss.

(F) Hair infected by Microsporum gypseum. Shows mass of large, irregularly shaped spores covering surface of a hair.

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service

Communicable Disease Center
Mycology Laboratory
Chamblee, Georgia

Specimen:

CDC No.:

Owner:

Veterinarian:

Preliminary Report

Direct examination: Wood's light:
Microscopic:

Culture report to follow.

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11-53

Fig. 3. Preliminary report card.

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service

Communicable Disease Center
Mycology Laboratory
Chamblee, Georgia

Specimen:

CDC No.:

Owner:

Veterinarian:

Final Report

Direct examination: Wood's light:
Microscopic:

Culture:

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Fig. 4. Final report card.

TABLE 1. Reported Isolations of Dermatophytes.

ANIMAL	ORGANISM													
	E. Floccosum	M. Audouini	M. Canis	M. Gypseum	T. Concentricum	T. Ferrugineum	T. Gallinae	T. Megnini	T. Mentagrophytes	T. Rubrum	T. Schoenleini	T. Tonsurans	T. Verrucosum	T. Violaceum
Man	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cat			+	+					+		+			
Cattle								+	+				+	
Chicken				+			+							
Dog		+	+	+			+		+		+		+	
Horse			+	+					+				+	
Sheep													+	
Swine														
Turkey							+							
Chinchilla									+					
Fox									+					
Guinea Pig									+					
Mice				+					+		+			
Monkey		+	+	+					+					
Muskrat									+					
Opossum									+					
Rabbit									+					
Squirrel									+					
Tiger				+										
Kangaroo									+					
SOIL				+										
DUNG									+					

In addition to above data, *T. Rubrum* also has been isolated recently from a dog and cattle.

localized in or around the areas mentioned and in other instances lesions are seen at the base of the ears. Sometimes the back is involved and in severe cases the whole body may be affected.

Guinea Pigs. Lesions appear to start on the tip of the nose and spread to areas of the head above or below the eyes, on the top of the head, and on the ear. Later lesions develop over the posterior portion of the back. A few develop leg lesions.

Mice. Laboratory mice may develop a skin disease manifested by loss of hair and increased scaling. The bald areas are irregular in shape and size, with indistinct margins. These are located predominantly on the dorsum of the head and back, the abdomen rarely being affected. The only visible inflammation of the skin is increased scaling.

There are at least 14 species of fungi that cause ringworm in man, and among these, nine have been isolated from animals. The reported species of dermatophytes isolated from animals are shown in table 1. From the data accumulated thus far, four organisms appear to be common in animals: *M. canis* — dogs, cats, and monkeys; *M. gypseum* — dogs; *Trichophyton mentagrophytes* — horses, dogs, chinchillas, and guinea pigs; and *T. verrucosum* in cattle. Two of these organisms appear to be most important from a public health standpoint — *M. canis* in dogs and cats and *T. verrucosum* in cattle.

Very little is known concerning the source of most ringworm infections. *M. gypseum* is the only dermatophyte that is commonly isolated from soil, and in this case it is assumed that animals and man acquire infection from exposure to soil containing this fungus.

It is hoped that as a result of the study outlined, that many questions regarding the prevalence and public health importance of animal ringworm infections may be answered.

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Food Preservation by Atomic Rays

We are assured by both the scientific and lay press that food preservation by ray sterilization is no idle dream of processors. Many research institutions, private industry, and government agencies are interested and much has been learned about this new method of "fresh-storing" various foods without refrigeration.

▼ ▼ ▼

Garbage cooking has reduced the incidence of diarrhea on garbage feeding ranches.

Diseases of Suckling Pigs

A comprehensive list of direct and predisposing factors responsible for diseases among newborn pigs contains a total of 41 conditions classified under five headings[18]. These are: (1) Congenital and genetic faults, (2) vitamin deficiencies, (3) mineral deficiencies, (4) errors of husbandry and management, (5) infectious diseases.

The author emphasizes those husbandry matters so frequently neglected by swine growers. Rearing healthy litters for profitable production has been shown to be dependent on the exercise of sound management practices. Identification by ear notching sows and baby pigs is essential in larger operations. Several conditions common in the Midwest are given attention including; hypoglycemia, pig scours, transmissible gastroenteritis, and atrophic rhinitis. Of hypoglycemia (sleepers, three-day pig disease) the author states that the disease condition is essentially an anomaly resulting from faulty husbandry. Symptoms of subnormal body temperature, failure to nurse, marked dullness, shivering, and progressive lapse into a comatose state differentiate hypoglycemia. Provision for comfort (bedding and warmth) must be made, then treat all affected litters with intraperitoneal injections (10 cc.) of warmed 5% solution of dextrose in saline. Do not use high concentrations of glucose solution—to do so may cause fatal kidney block.

Transmissible gastroenteritis (T.G.E.) presents the most serious aspects of the entire group of diseases of the digestive tract regardless of cause. Treatment of T.G.E. is unsatisfactory and death losses are disastrous when the disease strikes. Recommendations for handling are concerned exclusively with prevention—no satisfactory treatment is available.

▼ ▼ ▼

In experiences at the Michigan State College Veterinary Clinic, Dr. G. C. Moore reports that only 50% of cases of Johne's disease proved positive by bacteriological examination reacted positive to intradermal johnin; whereas 100% of these gave positive reaction to intravenous injections of avian tuberculin (temperature test).

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[18]Quin, A. H., Some Diseases of Suckling Pigs: Their Control and Treatment. *University of Pennsylvania Vet. Ext. Qrtly.*, 138, Apr. 8, 1955.

Animal Disease Reporting Service†

J. D. SALISBURY*, D.V.M., Indianapolis, Indiana

THE development of an animal disease reporting service, or, for that matter, a reporting service of any type never has come easily. A comparison between animal and human morbidity reporting can be made to point out the rapidity of their developments. If the veterinarian is as slow to pick up the reporting of animal diseases as the physician has been in reporting human diseases, then I shall long since be dead and buried before it becomes a national system. Fortunately, the development of animal disease reporting in Indiana has been rather rapid. Maintaining and sustaining the reporting system is now the problem before us. But before discussing this phase of the animal disease reporting, I should like to enlarge a little upon human morbidity reporting.

In 1878 Congress authorized the collection of morbidity data for use in connection with quarantine measures against such diseases as cholera, smallpox, plague, and yellow fever. One year later, a specified appropriation was made for the collection and publication of reports of notifiable diseases. That is to say, the Congress recognized the necessity for financial support for uniformity in obtaining statistics about human diseases.

At this time few reports of notifiable diseases were received from cities and states prior to 1900, and it was not until after 1925 that all states reported regularly. The responsibility for this program has been under several divisions and was moved to the National Office of Vital Statistics as late as 1949. Revision of morbidity reporting procedures is recognized as necessary in the maintenance of a vital disease reporting system. Therefore, frequent conferences and discussions regarding revising of the morbidity reporting procedures have occurred, and will likely occur, in the future.

The primary purpose of reporting of any communicable disease, whether in animal or in man, is to determine, as early as possible, the prevalence of any disease in a community. Those which affect man have always been front-page newspaper stories when occurring in sufficient numbers to alarm. Among these are the influenza epidemic of 1918, the encephalitic outbreak in St. Louis in 1933 and more recently, the large epidemic occurrences of poliomyelitis. Reports of incidence, therefore, have served as an initial step in determining areas where control measures were necessary. Later, the collection and assembling of data provided basic material for the planning of more effective programs in the prevention and control of some human infectious diseases. The same functions may apply to an animal disease reporting service.

Recognizing the need for this service with regard to the animal population, several states have attempted to establish suitable systems. These have met with varied response, and in many cases, have failed to survive. Because information concerning disease conditions has been meager and inaccurate, both at state and national levels, livestock officials have been embarrassed when requested for specific information.

Recognizing this fact, certain states requested of the National Office of Vital Statistics a supply of report forms to initiate systematic reporting. The first such form was printed in 1948 for use in Colorado. Apparently, response was unsatisfactory. From that time until the middle of 1951, groundwork was initiated in Indiana for the development of a reporting system. Many of you here in this audience probably attended a district association meeting at which the system was discussed. This was the first project introduced under the joint signatures of the State Health Officer and the State Veterinarian with approval of a State Veterinary Medical Association.

Unfortunately, none of the individuals concerned at the present time were then concerned with the development of animal morbidity reporting. The program in this state has had outstanding response from the practitioners, and may I take this opportunity to express my sincere appreciation to you members of the association who participate. The

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†Presented at the 71st annual meeting of the Indiana Veterinary Medical Association, Indianapolis, Jan. 12-14, 1955.

*Public Health Veterinarian, Indiana State Board of Health.

soundness in the planning is attested by the fact that practitioners continue to send in biweekly reports although receiving a minimum of service in return. It is my earnest desire that practitioners continue or increase their efforts of reporting and that you, in turn, receive extensive services from the interested state agencies.

However, the basic function is that of the veterinarian reporting on his animal disease report card the number of disease cases, and the premises involved, of various diseases which he sees during the course of his practice. Without the submission of these reports, no baseline can be established for the occurrence of any specific disease.

You will recall that recently you received an annual tabulation of the 1953 morbidity statistics. Accompanying the statistical table were graphs depicting the seasonal occurrence of specific, selected diseases. With the continuation of this system over the period of five or six, perhaps ten years, sufficient statistical information should be gathered to enable regulatory officials to establish base-lines for disease occurrence. We fully realize that the present percentage of reporting does not indicate the total occurrence of disease. However, that which is reported will enable us to discuss the so-called base-line occurrence from the standpoint of intelligent guessing or informed estimates.

Certainly in the past there has never been available, from a representative group of states, a collection of statistics which would enable interested parties to guess even vaguely at the occurrence of specific animal diseases other than bovine brucellosis and tuberculosis. Certainly, any estimate at economic losses, based upon present disease statistics or those available in the past, are subject to wide variation and gross inaccuracies. However, with the advent of animal morbidity reporting in nearly a score of states, the error in guessing may be confined to much more narrow limits than heretofore.

At the present time there are eight states in addition to Indiana using the National Office of Vital Statistics report cards. Three more states are expected to initiate systems. Five states are operating animal morbidity reporting systems independent of the N.O.V.S. card with the possibility of three more states doing so this year. So it can be expected that in 1955 there will be morbidity reporting systems operated by 20 states.

In most of these, reporting is a cooperative venture of the State Board of Health, Livestock Sanitary Group, the veterinary association, and the U. S. Public Health Service. In those states where there are schools of veterinary medicine, these generally also participate. It is my personal observation that in those states where there is active cooperation between the enumerated groups, the animal morbidity reporting systems are functioning in such a manner as to be beneficial to all concerned. Where support is not forthcoming, generally the morbidity reporting systems wither and eventually die.

During the past 11 months practitioners have reported over 81,000 cases of disease occurring on 5,060 odd premises. This figure is probably not particularly startling, but when it is realized that non-professional people tabulate these diseases, perhaps you can understand why certain rather glaring errors may occur occasionally. During the three years which this system has operated, there has been compiled a glossary of disease terms from which has been established an animal disease code. Practitioners in Indiana have reported more than 125 different terms indicating a disease status. Undoubtedly, there has been considerable overlapping such as the enteric infections where enteritis, necrotic enteritis, swine dysentery, dysentery have been reported.

The following example may serve to illustrate a point. During the course of the year, in looking through the cards returned by the practitioner, I saw no indication that foot-and-mouth disease existed in the state of Indiana. Cases of vesicular disease in cattle were reported. However, when the animal tabulation was made, coding of vesicular disease in cattle was made by a young lady with little medical knowledge but who is an excellent I.B.M. machine operator. When coding vesicular disease in cattle, she saw the reference that foot-and-mouth disease was a classic vesicular disease in cattle, so on annual tabulation, I found several cases for foot-and-mouth disease tabulated.

Fortunately, all cards which had been returned by participating veterinarians had been saved and, by checking back through the month in which the F. and M. was reported, I found that the actual report on the card indicated vesicular stomatitis. Perhaps this serves to show that the disease reporting system can not be allowed to run its own course without constant supervision.

The same might be said for human morbidity reporting. During the year 1953, there were 14 cases of glanders reported in man in the United States. Checkup showed that

one had been reported from Indiana. In checking back through the forms to see why this had occurred with no glanders having been reported in the horse population, it was found that a postal cancellation mark had left some ink in the space indicating the occurrence of glanders in man. Inadvertently, this had been taken as the mark of a health officer reporting a human case. Even though this error had been eliminated from weekly reports of human morbidity, it nevertheless did slip by in an annual tabulation. With this in mind one can see how occasional errors occur.

Operation Costs

Cost for the operation of an animal morbidity system is not insignificant. Without considering the salaries of clerical personnel involved in addressographing post cards or in mailing of such literature as accompanies the system, the monthly expenditure for mailing and materials to include tabulating amounts to a little more than $100. a month. Such an expenditure in any state organization requires a budgetary provision. To date, the animal morbidity reporting system has been surviving by begging, borrowing, or stealing loose bits of odds and ends from here and there in the budget. However, as of next July 1, it is hoped that the current Legislature will see fit to include budgetary provision for the maintenance of an animal morbidity reporting system.

That this item is not inconsequential for the 48 states may be the reason why federal appropriations to the United States Department of Agriculture, Livestock Regulatory Program has not received budgetary approval for the operation of a national morbidity reporting system. The original intent is that it is a logical function of the state livestock facility. During recent months, interest of the U.S.D.A. has been revived under the directorship of Dr. C. D. Van Houweling. The future may see an adoption by that branch of animal morbidity reporting.

Brig. General J. A. McCallum, in a discussion of Veterinary Medicine and the Public at the University of Pennsylvania in January, 1954, stated: "It is astounding and deplorable in this era of veterinary preventive medicine that in the United States there is no law or regulation requiring the reporting of communicable disease of animals to any central office of the federal government." He further quoted Dr. R. C. Newton, vice-president of Swift and Co., who said, "Setting out to eradicate a disease without a knowledge of the losses it causes is like a ship sailing out into an uncharted stream."

Not too long ago one of the human hospitals here in Indianapolis isolated *Listeria monocytogenes* from a patient exhibiting symptoms of encephalitis. This positive bacterial isolation represents what is probably the first recognized case of listeriosis in man to occur in Indiana. At the recent meeting of the American Veterinary Medical Association, Doctors DeLay and Schultz of Sacramento, Calif., reported on listeriosis in man and animal. They reported the occurrence of 14 human cases in California since 1951. In California as elsewhere, it is not felt that sufficient data are available to permit definite conclusions concerning the epizootiology and epidemiology of this disease. However, the fact that it has occurred within this state should signal the physician and the veterinary practitioner alike to the possible existence of the infection both in animals and, perhaps rarely, in man. Other occurrences, much in the same nature, could be reported.

The foregoing example serves to point out the close relationship of animal and human diseases. As virus and tissue culture research increases in scope and intensity, many more occurrences of animal diseases in man will be brought to light. Many horizons in disease research barely have been cited. What the future holds cannot be predicted, but without a picture of the disease trends of the past and the present, the relationship of these trends in the future may not be properly evaluated.

With the prediction that by 1975 this country will have a population of well over 200,000,000, food supply will become a problem. In all probability, there will be the effort at concentrating the number of animals into the now prosperous livestock areas and out into the marginal areas of operation. With this tendency to increase the livestock concentration comes a probability of increased disease incidence. Certainly, the conditions may be so established as to permit the rapid development should a highly contagious disease gain foothold. A well established animal morbidity reporting system would indicate immediately such a changing picture if sufficient veterinarians were reporting from that particular area with regularity. Information of this type could enable regulatory officials to start immediately effective action toward controlling such a situation.

(*Continued on page 304*)

Problems Of Current Interest In Swine Practice†

A. H. QUIN,* D.V.M., Kansas City, Missouri

THE first time that I appeared on the program of the Illinois Veterinary Medical Association, more than 20 years ago, to discuss swine diseases, the picture was comparatively simple. As major entities, we dealt with hog cholera, swine plague, necrotic enteritis, and a miscellaneous catch pot for everything else known as "mixed infection".

The contemporary swine diseases picture becomes comparatively more complex as our research scientists and veterinary practitioners segregate many specific entities from the handy diagnosis of mixed infection so popular only a quarter-century ago. Swine erysipelas, atrophic rhinitis, gut edema (more properly named enterotoxemia), and leptospirosis, are but a few examples of this changing picture. Recently I compiled a list of some 30 specific diseases involving suckling pigs, all of which occur and are responsible for setbacks, or baby pig losses, on Midwest farms.

This paper will be confined to a discussion of a few swine diseases of current interest.

Enterotoxemia

Within the past five years, increasing numbers of reports of enterotoxemia or pig edema have been noted. The symptom picture includes swollen eyelids, an initial high temperature, alteration of squeal due to pharyngeal changes, incoordination, progressive paralysis, and high mortality against a variable morbidity.

The necropsy picture varies from no perceptible lesions or edema of the mesenteric glands, to profound jello-like molds around the intestines, or a grossly thickened stomach wall with the serosa and mucosa separated by gray, jelly-like transudate.

Pathogically, this enterotoxemia of shotes closely parallels the similar condition noted in feeder lambs. It is related to fast growth and high concentrate rations and predisposed by stress factors, such as castration, vaccination, or sudden changes of environment or feeding.

Timoney[1] and other workers in Ireland have reproduced pig enterotoxemia by intravenous injections of ingesta from the small intestines of fatal cases. They further postulate that the syndrome is not caused by *Clostridium perfringens*, type D. However, the odds are long that the condition is a true enterotoxemia, probably clostridial in origin.

Fig. 1*. Enterotoxemia. Edema and hemorrhage in the pharyngeal region and epiglottis may occur.

In the field handling of enterotoxemia, purgation of the drove with Epsom salts (1 lb. to 10 head of 50 lb. shotes), or raw linseed oil (1 oz. per head) in a light, semi-liquid, trough ration is effective. Care must be exercised in bringing the drove back on full feed. It also is advisable to mix 10 oz. of flowers of sulfur to the total ration of each 100 head of shotes daily for two to three weeks after an outbreak.

Leptospirosis

Extensive sampling of swine blood at packing houses reveals that some 28% of all samples give significantly positive titers against *Leptospira pomona* antigen. What the reaction percentage is to antigen from at least 32 other serotypes of Leptospira remains to be tabulated.

Here in the midwestern states, and more notably in Illinois, reports have been made of abortion storms in sows due to leptospirosis. These abortions occur at any time during gestation, are not accompanied by visible sickness, and have involved droves which are either Brucella negative or those with a low incidence of brucellosis.

†Presented at the 23rd annual meeting of the Illinois State Veterinary Medical Association, Chicago, Feb. 14-16, 1955.

*President, American Veterinary Medical Association.

*Photos courtesy Dr. Paul C. Bennett, Iowa Diagnostic Laboratory, Ames.

While a single blood test showing a number of positive titers above 1:200 is diagnostically significant, most conclusive diagnosis is gained by laboratory identification of Leptospira in aborted fetuses.

Doctor Marsh of Princeton, Ill., at the recent Iowa meeting, reports good results, when the disease is detected early, by isolation of aborting sows and vaccination of apparently normal sows with two doses of Leptospira vaccine. And, while it was not possible to provide controls by splitting the same droves of sows, effective prevention seemed to follow vaccination of gilts just prior to breeding. At least no abortion losses occurred in droves where variable losses had occurred during the previous farrowing season. Here again we are in need of extensive field tests under properly controlled conditions before we can evaluate critically the prophylactic value of leptospirosis vaccine in breeding swine.

In passing it may be mentioned that, in many countries of the world, so-called swine-herd's disease of man, a severe febrile illness often accompanied by iridocyclitis, is caused by *Leptospira pomona*. For this reason, both veterinarians and swine owners should exercise due caution against exposure while working with brood sows during an abortion storm.

Fig. 2*. Marked intestinal hemorrhages of enterotoxemia of swine which lesions parallel those observed in a similar condition in lambs caused by *Clostridium perfringens* type D.

The clinical picture of acute leptospirosis, as it affects growing shotes, has not been defined clearly. I have felt for some time however, that droves in which sporadic deaths with symptoms and lesions comparable to canicola leptospirosis of dogs, (marked glomerulonephritis, enteritis, hepatic damage and septicemia, a bladder filled with red urine, with or without jaundice) may be leptospirosis. The incidence is low, but every veterinarian doing swine practice has autopsied isolated shotes that revealed identical lesions. Here again we need a closer hook-up between farm autopsies and laboratory confirmation.

Mycotic Enteritis

Within the past few years we have noted an increase, though not an alarming one, of mycotic enteritis in shote-age pigs. Here again the morbidity is light and the symptom picture inconclusive (anorexia, progressive gauntness, increased thirst, and constipation).

On autopsy, lesions are confined to the small intestines, the gut appearing tubular, thicker than normal, and inclined to be friable and broken easily when handled. When the small intestine is slit, one observes that a colored, carpet-like membrane covers either all or part of the mucosa. When this is peeled off, there is noted a pigmented mucous membrane that is black, slate gray, greenish, or off color pink-red.

From these lesions of mycotic enteritis molds of the Monilia species can be isolated in Sabaraud's media.

Whether or not this type of intestinal moniliasis is influenced by rations containing antibiotic residues is another problem awaiting the decisions of research laboratories.

Treatment comprises withholding antibiotic residue feeds for ten days and putting the drove on 1:10,000 copper sulfate in the drinking water or in a trough ration of semisolid buttermilk with ground grains and the usual level of mixed proteins.

Diffuse Moist Eczema

Another herd condition having no known specific causation, the incidence being higher in recent years, is a diffuse type of moist eczema. Usually this is located over the neck and shoulders or between the groins and can be especially troublesome in purebred herds during hot weather. The condition can not be tied to allergies as it is seen under too many variant regimens of feeding and environment. While it is true that the skin disease is observed frequently of late years, there is no research evidence to link it with feeding antibiotic residues; a postulation voiced by some hog breeders.

The favorite treatment of our Canadian colleagues is to scrub affected pigs with a stiff brush and tincture of green soap, then put them on sodium arsanilate (1 tablet per gallon of drinking water) for five days on, five days

Fig. 3*. Photosensitive dermatitis, parakeratosis, moist eczema, swine pox, and ectoparasites complicate diagnosis of swine skin disease.

off, over a 20-day period. At last month's Iowa meeting, a course of tetraiodide powder (six days on, six days off) was cited as being quite effective.

Virus Pig Pneumonia

For many years we have seen a herd syndrome of swine with the following type of clinical history: Beginning even before weaning, almost all pigs in a given drove develop a dry, non-productive type of cough. This is especially noticeable early in the morning or when the pigs are stirred up and forced to move about. There is an occasional death and the gains are uneven, with considerable stunting and too high a percentage of runts. In the past, we have been inclined to call it "yard cough", "dust pneumonia", "mixed infection", or similar nonspecific descriptive titles.

In England, Gulrajani and Beveridge[3] and Betts[3] have described a syndrome called virus pig pneumonia (VPP) which appears similar to, or identical with, the condition seen commonly in swine of our midwestern states.

The English workers found that 61.3% of 1,000 shotes at slaughter carried pneumonic lung lesions, without fibrosis, that are typical of VPP infection. A great majority of these lesions were confined to the distal lung areas; the cardiac and apical lobes. This pneumonic lesion is grayish in color (sometimes plum colored) and looks like lymphoid tissue with a clear-cut and slightly depressed line of demarcation from normal lung tissue. Occasionally, there is pleurisy and pericarditis and the bronchial and mediastinal lymph glands are enlarged and edematous.

Acute cases of VPP in young pigs are characterized by intense pulmonary congestion and edema with much froth in the trachea. In sucklings, the only lesion may be extensively swollen mediastinal glands.

The Britishers isolated a specific virus from VPP pigs and reproduced virus pig pneumonia by intratracheal injection of virus-laden tissues from previously inoculated animals. The incubation period, under laboratory conditions, is from seven to eight days, and under field conditions from ten to 16 days. Virus was recovered from hogs inoculated 66 weeks previously, and this indicates that apparently normal breeding replacements may serve as carriers.

The specific particles of VPP virus are large, ranging upward from 200 millimicrons, suggesting that it may belong to the psitticosis-granuloma group.

English journals report that chloromycetin® is the only antibiotic of value in treating VPP. They report helpful results in young shotes by 100 mg. doses daily for five days of the injectable type of this antibiotic.

Fig. 4*. Swine eczema having no known specific causation.

Glasser's Disease

Glasser's disease is a seemingly specific entity which is widespread in central Europe and reported from many other countries. European authorities including Doctor Glasser are certain that the disease must exist in the United States.

Also known as infectious polyarthritis,[4] Glasser's disease has often been confused with swine erysipelas, for it closely resembles the latter disease and has even been called pseudo-erysipelas. However, it is said to be the only swine disease characterized by both polyarthritis and major serofibrinous inflammation of pleura, pericardium, peritoneum, and intestinal serosa.

The bibliography of this disease is rather confusing. Sutherland and Simmons[5] of Aus-

®Parke, Davis & Co., Detroit, Mich.

tralia report four outbreaks from which a hemophilus organism was isolated. Presumably the same organism was isolated by Hjarre and Wramby[6] of Sweden in 1942, and by Mayerhofer[7] in Germany in 1935.

Now McNutt, Leith, and Underbjerg[8] in 1945 isolated a virus in chick embryos and reproduced the disease in susceptible pigs with lesions of arthritis and involvement of the serous membranes.

Switzer[9] of Ames in 1953, isolated a filterable agent of the pleuropneumonia type that also reproduced peritonitis, pleuritis, pericarditis, and some arthritis in test pigs.

Willigan and Beamer[10] (*Jour. Am. Vet. Med. Assn.*, 126:118 [Feb.], 1955) report isolation of a transmissible agent from field cases exhibiting peritonitis and serofibrinous pericarditis. They carried the isolated agent through ten chick-embryo passages and successfully reproduced lesions of fibrinous pericarditis, peritonitis, and in one instance, arthritis. The same agent isolated from these pigs again reproduced the syndrome in a second lot of pigs.

While final identification studies are still in progress, the isolated agent, to quote Willigan and Beamer, "suggests a resemblance to members of the Rickettsia or the psitticosis-lymphogranuloma group of viruses."

Thus from all of these observations we can reasonably conclude that:

(1). The syndrome called Glasser's disease does exist in the United States.

(2). It can be confused easily with subacute erysipelas of young pigs under field conditions and may account for some of the alleged "breaks" in vaccination against erysipelas.

(3). The etiological agent probably is a virus as shown by McNutt, *et al*, by Switzer, and by Willigan and Beamer, rather than the hemophilus type organism cited by European and Australian workers.

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Growth Stimulation from Synthetic Estrogens

A review of the literature concerning the use of synthetic hormones having estrogenic properties appears in *Nutrition Reviews* for April 1955. In this the reviewer states that the fact appears to be firmly established that synthetic estrogens increase weight gains in fattening animals. The mechanism for this stimulation is not entirely clear, but conclusions from research data suggest that the entire endocrine system is involved and body metabolism increased. More work needs to be done to understand stimulating action under a variety of feeding conditions and the effect of hormone feeding on quality of carcasses.

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The year 1955 will likely be the greatest business year in our history.

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Animal Disease Reporting

(*Continued from page 300*)

Efficient livestock production will be critical in the maintenance of agricultural economy in the years to come. To maintain this efficiency, increased veterinary services probably will be demanded. Present mortality and morbidity averages must be reduced and feeding efficiency increased to maintain the possible standards of agricultural production necessary in the next 20 years. Through animal morbidity reporting, we may have measures for use in determining degree of success in reducing mortality and morbidity averages.

The future of veterinary medicine is extremely promising and with but few limitations. It is dependent upon the veterinary profession fulfilling its obligations and grasping its opportunities.

Demodex Folliculorum Studies: V. Demodectic Mange In Cattle

F. R. KOUTZ,* D.V.M., Columbus, Ohio

DEMODECTIC mange has been considered uncommon in cattle in the United States and of no importance. Our surveys and experimental work in demodectic mange over an eight-year period have shown that the disease is quite prevalent in this country and found in many valuable herds, especially being a problem in show animals because of the blemishing lesions. The condition often is not diagnosed because of a general lack of knowledge of its prevalence and identification.

The demodectic mange mite in cattle was first found by Gros in 1845 and later reported by Faxon in 1878 from cattle hides being prepared for tanning. The lesions described as "pits and pimples filled with mites" were especially prevalent in the region of the neck and shoulders where they caused great damage to the value of the hides. Stiles, in 1892, gave a more detailed report on the finding of the demodectic mites in American cattle hides and supported the reports of others on the prevalence of the disease in cattle from the middle west and some southern districts.

Demodectic mange in cattle is caused by the mite, *Demodex bovis*-Stiles 1892. The body of the mite is elongated, cigar-shaped, being about three to three-and one-half times as long as broad. (Fig. 1). The average length is 220 microns, while the width is 70 microns. On the anterior portion of the body are eight short, stubby legs consisting of five segments, while the posterior portion is annulated and pointed. The larval stage has only three pairs of legs. The cheliceriae are stylet-shaped; the palps consist of three segments. The genital opening of the male is dorsal in the center of the podosomal region, while that of the female is ventral between, and slightly behind, the fourth pair of coxae. The adult is short and wide in comparison with other species such as that of *Demodex canis*. The ova are oval, averaging 70 microns long and 45 microns wide.

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The life cycle of *Demodex bovis*, although not fully known, does follow the typical mite cycle. All stages in the development of the mite, (oval, larval, nymphal, and adult) can be demonstrated readily in the thick, cheesy material from abscesses. The early invasion is usually through the hair follicles in which the

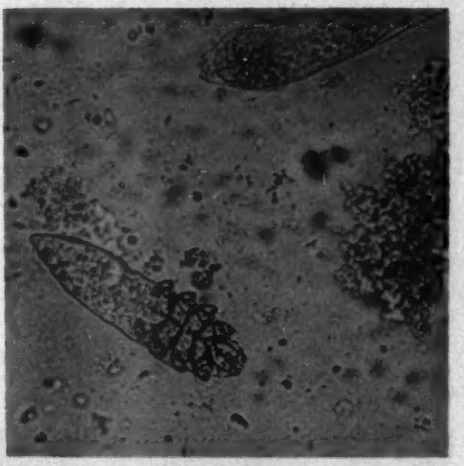

Fig. 1. Demodex bovis, high power.

mites rapidly increase in numbers. To date no evidence of an internal phase has been demonstrated.

In work done at Ohio State University, many herds have been found to be infected. Reports and specimens from other states have shown the same incidence. The disease is widespread as shown by some herds where the mange has existed in a chronic stage for long periods. In one herd under observation, the disease has persisted for over six years. In other herds acute outbreaks have occurred. Individual animals have been found with extensive, chronic lesions, especially many valuable animals found infected at fairs and shows where they could not be shown because of blemishes on the skin. If proper examination and diagnosis is made, the disease may be found in many animals.

The exact manner of transmission is not known definitely, but in some experimental cases it has been transmitted directly to susceptible animals. In one herd of 12 affected cows, a young, ten-month-old bull introduced in the herd developed an acute demodectic mange condition in a few weeks. There was a rise in temperature, depression, and many open lesions. In some herds only one or two were affected with no evidence of the spread of mange to the others. One animal found negative in an infected herd was still negative six years later even though it had been in close contact with the other infected animals. Examination of the hide after slaughter did not reveal any lesions or mites.

The lesions vary according to the disease pattern. In the early stages, a great deal of blood oozes from the invasion of the skin and follicles. As the disease progresses, small papules develop which later form abscesses filled with numerous mites. These abscesses will vary in size from one-quarter inch to almost an inch in diameter. The abscess when opened contains a thick, dirty-white, purulent material. After the abscess breaks, the thick pus oozes out, and together with hair and debris form a scab-plug over the lesion. When the scab is removed, the inside core-formation comes out with the scab. In the core formation are myriads of mites in all stages of the life cycle. Later the abscess dries and heals, but other lesions may form in the vicinity.

The abscesses are not always in great numbers. In chronic cases only a few may be found over the shoulders, but in some cases they may be over the entire body. The easiest way to find them is to run the hand over the body to palpate for the small abscess.

None of the numerous treatment methods tried have been successful. Various combinations of benzyl-benzoate emulsions and solutions have been tried with little result. The poor results in treatment are due probably to inability of the drug to penetrate the thick capsule of the abscess. If the abscess is incised and the inside swabbed with iodine the mites are killed easily. During the early stage, or open stage periods, drugs applied to lesions will kill the mites.

The disease, except in the acute stages, does not affect the general health of the animal for there is no nervousness, no pruritus, no scratch reflex and, in one experimental observation herd, the milk production was at a top level. During the so-called "acute stage" there may be a rise in temperature, depression, and active lesions from which oozes a volume of blood.

It has been observed that some animals left untreated often will recover or few lesions persist. A few small abscesses may persist but usually they are hard to find. Sometimes this is referred to as "natural recession" or "spontaneous recovery". But even after several years, if a careful examination is made, a few mites may be found.

The disease does have increasing economic importance because of the possible effect on the general health of the young animal that

(Continued on page 330)

Fig. 2. Typical appearance of small abscesses along shoulder and brisket.

Treatment of Bovine and Porcine Metritis: Report of Ten Cases

TOM D. FREEMAN,* D.V.M., Mayfield, Kentucky

Varied aspects of neomycin therapy have been described in current veterinary literature, but only three articles refer to intrauterine use of this new antibiotic. One writer mentions using a powdered form of neomycin (mycipo)® containing 5 mg. of neomycin sulfate per gram in a special nonirritating lactose base;[1] another describes beneficial results obtained with neomycin powder placed directly into the uterus or instilled as an aqueous solution;[2] a third briefly refers to intrauterine use in sows[3]. Intrauterine use in sheep and dogs also has been mentioned.

This paper reports a study in which nine cows and one sow were treated with an investigational neomycin uterine tablet trademarked mycisulfa®**.

Materials

Mycisulfa uterine tablets contain neomycin sulfate, 100 mg. (equivalent to 70 mg. neomycin base); sulfathiazole, 2.27 gm.; urea, 1 gm.; and boric acid, 2 gm. One of the newer broad spectrum antibiotics, neomycin, has primarily bactericidal action against many of the Gram-positive and Gram-negative bacteria. The antibiotic is fully active in presence of pus and pus-forming organisms.

The antibacterial action of sulfathiazole is complementary to the effects of neomycin, particularly against staphylococci and the hemolytic streptococci group A. This activity is believed to be increased by urea. While the mechanism of action is not well understood, proteolytic action on uterine exudates and neutralization of sulfonamide antagonists is believed to be involved. The proteolytic effect is confined to necrotic tissue.

Boric acid is a mild antiseptic, having protectant and soothing effects when applied to mucous membranes.

Case Histories

Ten cases demonstrating similar symptoms and having a guarded prognosis were selected for treatment with this investigational product. Temperatures of all animals were elevated. Cows were off feed, had staggering gaits, and were generally unable to rise without assistance. Cases 1, 3, 4, 5, 6, and 7 had particularly offensive vaginal discharges of a reddish-brown liquid. Uteri of these animals contained one to four gallons of this material, and shreds of necrotic placenta.

Supportive therapy administered in the indicated cases consisted of 250-500 cc. of calcium gluconate and dextrose intravenously, 10 cc. of caffeine sodium benzoate intramuscularly in the more depressed cases, and a stimulating tonic.

Case 1. Jersey, eight year of age. This cow calved three days prior to examination. The uterus had sustained moderate lacerations during parturition, and severe metritis subsequently developed. The animal was toxic, off feed, and demonstrated a temperature of 104 F. A portion of the placenta was removed manually and one mycisulfa tablet placed in each uterine horn. Supportive therapy also was given. The cow responded quickly and was eating in 24 hours. No further treatment was necessary.

Case 2. Jersey, four years of age. This animal had calved four days prior to examination and had a retained placenta. Temperature was 102 F. and a mild metritis was present. One mycisulfa tablet was placed in each horn. Response was excellent and no other therapy was necessary.

Case 3. Jersey, seven years of age. Twin, premature calves had been delivered and two sulfa-urea tablets placed in each horn for prophylaxis. Diethylstilbestrol, 30 mg. had been administered intramuscularly. Three days later the animal was toxic, off feed, weak, and demonstrated a temperature of 104 F. Severe metritis was evident. The placenta was removed manually and one mycisulfa tablet placed in each horn. Diethylstilbestrol, 30 mg., was administered intramuscularly, and supportive treatment given. Recovery was uneventful.

Case 4. Holstein, four years of age. Bought at a sale and trucked 250 miles two weeks previously, this cow was toxic and had a vaginal discharge. An emphysematous fetus was delivered, and one mycisulfa tablet was placed in each horn. The animal responded well and no further treatment was necessary.

Case 5. Hereford, six years of age. Having calved five days before examination, this animal was toxic, off feed, suffered diarrhea, severe metritis, and a temperature of 105.2 F. The placenta was removed and one mycisulfa tablet placed in each horn. Diethylstilbestrol, 30 mg., was administered, and supportive treatment given. Recovery was uneventful.

*Northington Veterinary Hospital.

®The Upjohn Company, Kalamazoo, Mich.

**Investigational product supplied by Dr. Kenneth B. Haas, Department of Veterinary Medicine, The Upjohn Company, Kalamazoo, Mich.

Case 6. Jersey, five years of age. This cow had calved four days earlier, and general metritis was now present. Treatment consisted of diethylstilbestrol, 30 mg., given intramuscularly, and one mycisulfa tablet inserted into each uterine horn. Response was excellent.

Case 7. Jersey, four years of age. This animal calved ten days previously. The owner had attempted to remove the placenta on the second day after calving. Temperature was 105.4 F. The cow was toxic, weak, moribund, and had severe metritis with associated ketosis. Prognosis was poor. Neomycin and supportive therapy failed to save the case, and the animal died 18 hours later.

Case 8. Five-year-old Jersey. The cow had calved a month prematurely, and placental removal had been attempted on the third day. One mycisulfa tablet had been placed in each horn. Four days later the animal was exhibiting symptoms of metritis and was off feed. One mycisulfa tablet was placed in each horn and diethylstilbestrol, 30 mg., was administered. Response was excellent.

Case 9. Jersey, seven years of age. This patient aborted at seven months pregnancy, and three days later was toxic and weak, exhibited severe metritis and a temperature of 104.6 F. One mycisulfa tablet was placed in each horn. Diethylstilbestrol, 30 mg., and supportive therapy were administered. Response was excellent.

Case 10. Duroc-Jersey sow, two years of age. This sow, the only one included in the present study, had a prolapsed uterus which was lacerated and irritated. The uterus was replaced, one mycisulfa tablet inserted, and the vulva sutured to retain the inflamed tissues. Response was excellent and no further treatment was necessary. When bred, this animal conceived.

Summary

Nine cases of bovine metritis and one in a sow were selected for mycisulfa intrauterine therapy on the basis of severity. Response was satisfactory generally in all but one advanced case of ten-days standing. Combination of neomycin, sulfathiazole, urea and boric acid in a suitable tablet form in limited field trials has been followed by prompt recoveries when supportive measures indicated were employed.

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Animal Disease Virus Culture

Report of success in live-tissue culture of the virus of vesicular stomatitis of cattle and swine is one of the first to come from the Plum Island Animal Disease Laboratory.

This achievement is said to be of particular significance and marks the completion of an initial phase of the laboratory's research objective — study of vesicular diseases of livestock and development of effective control and eradication measures.

The Plum Island researchers, H. L. Bachrach, J. J. Callis, and W. R. Hess have developed a method for growing vesicular stomatitis virus on guinea pig kidney cells. In this procedure they used the same medium as that in which the virus of poliomyelitis is cultivated on monkey cells for vaccine production. They also reported success in virus culture on bovine-tongue tissue, which technic has been employed in Europe and Mexico for the production of foot-and-mouth disease vaccine. Tissue culture of the virus of vesicular stomatitis is an advance toward improved procedures for differential diagnosis and control of all three vesicular diseases.

Vesicular stomatitis is not rated as a major disease in the United States, but serious losses have occurred in isolated outbreaks. Its importance is its symptom similarity to dreaded foot-and-mouth disease. Laboratory culture of the causative agent of vesicular stomatitis is a necessary step toward simplifying diagnosis and dependable tissue-culture methods for foot-and-mouth disease and vesicular exanthema vaccine on a scale adequate for control of possible outbreaks that may occur.

The work reported also has tested the security measures designed for the conduct of virus research. When facilities now under construction are complete, full-scale operation can be expected to reveal new evidence on which control and eradication efforts can be based.

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The time has passed when many general practitioners can satisfactorily maintain a high standard of service without some laboratory aids. Practices without some laboratory aids can not compete very long against practices which do use laboratory assistance.—*Paul C. Bennett, D.V.M.*

Fighting Livestock Diseases Together

MORRIS ERDHEIM,* D.V.M., Chicago, Illinois

THE key word in this title is "together." Veterinarians and the feed industry people have been fighting diseases right along, but not together. My remarks will be limited to a discussion of this aspect of the problem.

The history of the relationship between veterinarians in the field and the feed industry representatives with which they came into contact (feed dealers and salesmen) is full of illustrations of misunderstanding, bickering, and open antagonism. The tragedy of this situation is that in addition to denying each other the friendship, respect, and help each has to offer the other, the livestock industry, which both are committed to serve, suffers. Livestock diseases could be fought much more effectively if the job were done cooperatively.

It is understandable why people who are asked to discuss this subject aproach it with caution. However, it appears that in an honest attempt to do something constructive in this regard, we should be able to analyze the whole picture carefully and calmly. The spirit of this analysis would be to seek causes rather than to fix blame. The information thus gathered would put us in a better position to deal with the problem, prevent its development, and do something about it where it still exists.

Let us first list the spheres of activity which are strictly in the veterinarian's scope. It is his job to diagnose and treat disease. It is his obligation to his client and to his profession to use his clinical know-how and available laboratory facilities to get an accurate diagnosis and to institute appropriate treatment. He also must give his client advice on disease prevention, sanitation, disposition of animals that are not likely to be profitable, et cetera.

On the other hand, the feed man's job is to provide the farmer with a feed product and feeding instructions designed to yield the greatest *economical* gains. The feeding program should make for the maximum production of milk, eggs, and meat at the least possible cost. This must all be accompished while maintaining the producing animal in the best of health.

Each group has a definite role in fighting livestock diseases. The veterinarian develops and participates in programs designed to control disease and the feed man assists maintenance of health through sound nutrition.

While these two areas appear distinct and separate, encroachment occurs on both sides. This encroachment comes about in two ways: First, there is an area of understandable overlap of interest. For instance, in the use of medicated feeds, both groups feel that this is a legitimate activity for members of their group. Second, there is the deliberate encroachment into the other fellow's territory for one reason or another.

Veterinarians have had many unsavory experiences with "lay" treatments. Every practitioner can list dozens of cases which were mistreated by laymen interference. Medicines which feed dealers sold have kept farmers from seeking veterinary diagnosis early enough for maximum benefit. This is especially true where infectious diseases are concerned. Indirectly, this action may have been the cause of spread of disease to other stock in the area. Medicaments sold to sloppy and careless individuals have worsened conditions they were designed to cure. Mastitis infusion medicines injected into the udder without proper preparation have converted a simple case of mastitis to gangrenous mastitis. The veterinarian can not easily overlook the unscupulous feed and mineral salesmen who make ridiculous claims for their feed. Nor can he look with favor on the feed salesmen who castrate pigs for buyer or perform other so-called "service work" which sometimes is simply outright quackery. The feed man who attempts to diagnose and treat livestock diseases also disturbs the veterinarian. There are more of these abuses which the vet-

Elsewhere in this issue is announcement of the association of the author of this article, Dr. Morris Erdheim, as a Department Editor of Veterinary Medicine. Doctor Erdheim is qualified to speak of nutrition of livestock from the maintenance of health aspect. This, in a sense, is preventive medicine having significance in many contagious and metabolic disease. His page will be entitled Veterinary Nutrition and will consider the multitude of problems presented daily that influence normal growth, gains, and reproduction, as well as quality of meat-source protein for human consumption.

*Staff Veterinarian Dawe's Laboratories.

erinary practitioner sees in his daily work. But these illustrations will suffice for the sake of this discussion.

The feed man, too, has an impressive song of woe. There are numerous examples of veterinarians in the field who make unjustified incrimination of feed as a source of cause of an existing condition. It may be done innocently, but it is just as damaging, nevertheless. The farmer tells the veterinarian, "My cows were OK until I switched to X feed." Without thinking, the veterinarian might say, "Quit this and go back to your former program." Innocent, but a black eye to the manufacturer of that feed. Many of us diagnose "vitamin deficiency' without examining the feed tag and feeding instructions to determine whether the feed is properly fortified or if it is being fed according to instructions. "Urea poisoning" has been tagged on an infectious disease simply because local veterinarians have been diagnosing much urea poisoning. Too few practitioners consider the ration in prescribing medicated feeds. Little attempt is made to determine whether a properly balanced feed is being fed. If medication or fortification is indicated, it is prescribed or dispensed to be included "so much in a hundred pounds of feed". Sometimes, it's "in a hundred pounds of oats". Little attempt is made to consider nutrition in practice, though most practitioners are aware of malnutrition when observed clinically.

There they are. Some of the cold, dirty gripes which form the background for the misunderstandings which exist in the field. The recital of this list should not be misunderstood to suggest that all feed dealers and all veterinarians are guilty of all the sins listed. Unfortunately, however, there is too much truth on both sides of the fence. Little was done in the past by each group to try to understand the other's position. This simply intensified misunderstanding. The situation has been reduced to a point where under the best of conditions, the feeling between the two groups is one of indifference. I am thinking of a feed company nutritionist and a veterinarian who are next-door neighbors and close, personal friends. They belong to the same clubs. Yet, the veterinarian makes diagnoses of vitamin deficiency in animals fed mixed feed prepared by that company, and he dispenses a vitamin fortification package routinely. No attempt is made by either man to visit about this with the thought of rendering better service to the farmer. Instead, each man does his job—one sells feed, the other makes a diagnosis and dispenses vitamins. Each goes on his way, continuing this friendship as though they were in completely unrelated fields. Sometimes the situation is even worse; it may develop into severe antagonism. One feed manufacturer told me that he had "absolutely no use for vets". He felt that they were put on earth for the sole purpose of plaguing him.

Sign of the Times

However, there are many signs indicating that the situation is improving. The Nutrition Council of the American Feed Manufacturers Association has had a representative of the American Veterinary Medical Association as an invited member for about five years now. A number of the regional feed dealers associations have invited veterinarians to speak at their conventions on the subject of Veterinarian-Feed Man Relationship. The Midwest Feed Manufacturers Association had Dr. C. K. Whitehair of Oklahoma on its program when it met in Kansas City earlier this year. His excellent talk was published in *Feedstuffs*. That same issue of this magazine carried another indication of this new trend. It was a story of a feed dealer in Maine who proved that working in "intimate cooperation" with the veterinary practitioner in his town proved to be a profitable proposition. In this particular instance, the veterinarian had a feeding program which he used in the control of ketosis in cattle. He "prescribed" a special prescription diet. This use of a prescription diet, where the veterinarian tells the feed man what to include in the feed is the ideal arrangement, but is probably too utopian for universal adoption at this stage of the game.

Let me assure you that many of the feed people are willing and eager to "go along" in this movement for working together. When the broad picture is outlined showing how they and the veterinarians can work toward the common goal to their mutual advantage, they become interested. This is true at the organization level where veterinarians are invited to speak at organization meetings. It is also true at the local level, where feed people refer trouble shooting problems of a disease nature to the veterinary practitioner.

The Problem of Medicated Feeds

Let's go back to the problem of "legitimate" overlap that we mentioned earlier. Generally speaking, this puts us in the area of medicated feeds. While it is true that veterinarians use medicaments to treat symptoms of malnutrition, the same medicaments are included in

the feed to prevent malnutrition. We can demonstrate this readily with vitamins. Vitamin A is used to treat the avitaminosis, and may be included in the feed to prevent the development of avitaminosis A. More than that, feed people sometimes dip into the veterinarian's medicine bag to find a useful feed ingredient. Stilbestrol, which is used in sterility work by veterinarians, can be used under certain carefully defined conditions as a growth stimulant for meat-producing animals. The same can be said for arsenicals and antibiotics.

It must be granted that the acceptability of a given substance as a feed ingredient must not depend on whether or not the veterinarian also may use it in treatment of disease. It would seem that a rational point of view would dictate that any ingredient which would improve the effectiveness of feed, is safe for the animal and the subsequent human consumer, and is most readily given by the oral route, could be incorporated into an animal feed to good advantage. As veterinarians, we might have to exercise some patience in trying to understand the reasonableness of using some of these products as feed ingredients.

Then we have the question of high antibiotic feeds. This category is most disturbing to us as veterinary practitioners, since it implies the dispensing of a "cure-all" package to treat all sorts of enteritis, secondary invaders in viral diseases, and obscure ailments. This is done without benefit of adequate diagnosis. Instead, the advice of a feed man who assures the farmer that this "ought to really do the job" is the most frequent method of putting these feeds to use. While it is true that this is not the best way to approach a disease problem, let us, in all fairness, recognize that we were among those who had some part in the development of this method of treatment. As veterinary practitioners, we ignored poultry practice. Poultry husbandry is a highly specialized science. Poultry nutrition is more advanced than the nutrition of the other classes of stock. The poultryman is proud of his field, and must get sound guidance to make a "go" of his business. When we denied him our services, he had to resort to the high level antibiotics feeds for help. In many instances, the feed people were forced into the high antibiotic feeds against better judgements. And it must be pointed out that this unscientific shotgun treatment helps often enough, so that it has become an accepted practice by the poultry industry.

What steps can be taken to improve the situation? At the upper echelons, more contacts between both groups is suggested. An excellent start in this direction already has been made. The A.V.M.A. representative to the Nutrition Council of the American Feed Manufacturers Association, the inclusion of veterinarians on the programs of feed dealers' meetings, publication of articles on the subject in popular feed trade journals, are all good signs. It is worth mentioning at this point that the A.V.M.A. has appointed a three man subcommittee to its Nutrition Committee for the purpose of organizing those veterinarians who are in the nutrition field. It is felt that because of their keener awareness of the sensitivities of the practicing veterinarians, and their familiarity with the feed industry, these people could help both groups see the common meeting ground. Obviously, the group has a broader scope of activity, but the American Association of Veterinary Nutritionists, too, is a step in the right direction.

On a more specific basis, feed people and veterinarians can do much to improve the situation at the grass roots level. Briefly, suggestions given feed people interested in such a program are as follows:

1. Visit the veterinarian in your area regularly.
   a. Familiarize him with your feeds.
   b. Develop a friendly spirit.
2. Invite him to see your mill in operation, and facilities.
3. Offer to prepare prescription rations for him.
4. Conduct a joint meeting between your salespeople and the local veterinarians.
5. Above all, reassure him that you have no intention of trying to diagnose or treat disease conditions in the field.

There is much more to this program. However, these points indicate some of the practical steps a feed man may take to encourage friendly relations with the veterinarian.

Recommendations for Veterinarians

What can the veterinarian do?

1. Familiarize himself with the feeds being sold in his territory. The feed companies all have feed tags, literature and advertising pieces which describe the feeds and the suggested feeding programs. These publications contain much useful information in practical nutrition which can be of help to the veterinarian. Often, what seems to be a nutritional problem in the field, is caused by the feeder's failure to follow instructions. This may show up as a deficiency.

2. Visit a feed mill and become familiar with the different forms of feed; pellets, mash,

crumbles. There are reasons for these different forms, and special problems associated in their manufacture. It is possible to lose a great deal of vitamin A activity, for instance, in the pelleting process. To counteract this possibility, the feed manufacturers try to get a stabilized form of the vitamin, and are careful about the temperature and moisture during the pelleting process.

3. Try to avail himself of the latest information in the nutrition field. It is well to know that when urea is misused, it is possible to cause symptoms of toxicity. However, we ought to know that as long as urea contributes only ⅓ or less of the protein portion of the ration, and that the animal has a supply of carbohydrate available in grain or molasses, there is little likelihood of urea poisoning. An obvious misdiagnosis implicating the feed disturbs the feed company, and can be the basis for much antagonism—the veterinarian as an individual loses prestige and causes a loss of prestige for the profession.

4. Arrange to have prescription formulas mixed at the mill. You can send the mill the drugs you want included in a given feed, and have them do it. There is less likelihood of error, the mixing will be more uniform, and you can be assured of the nutritional quality of the feed carrying the drug. When the farmer is depended on to mix the drug in feed, there is no way of being sure that the mix would be a well-balanced ration. In this regard, there is a practical problem of volume of production to consider. Feed people mix in large batches—ton lots or larger. However, this can be worked out between the feed man and the veterinarian.

5. Cultivate the feed man's friendship. Many of these people would engage less in the sale of biologics and medicines if they could see the whole picture. The selling of such materials for obscure conditions, or biologics for use by untrained personnel, is not without potential problems to the man making the sale. It becomes his fault when the vaccinated animals "break", or the treated animal does not respond to the medicine. With a little patience, much can be done along this line.

Importance of Practical Cooperation

Is the feed man-veterinarian marriage practical? Let me assure you that personal exeprience proves that it is. My practice was located in a town which had a feed dealer, a drug store, and a county agent. By cultivating their friendships, we managed to keep free of "competition" from those sources. In practice, I had a feeling about the worthwhileness of molasses for dairy cows, and I would suggest to my clients that they buy molasses, when the price was right. Naturally, it was bought from the feed dealer. This, and similar gestures, convinced the feed dealer that my friendship was important to his business, so he committed none of the abuses which would have antagonized me. In addition to that, he referred clients to me. We had no written or verbal contract, but we helped each other nevertheless. We accomplished a great deal for each other with this arrangement, and there was no encroachment.

It is true that in some cases, it takes patience to accomplish anything significant. However, the problem is important enough, and the stake great enough, to justify a little effort on the part of each of us.

If you think that this is a wild dream, let me point out that many of the feed companies in the country now have veterinarians on their staffs on a full time or consultant basis. Their approach is entirely practical. They send out scientific literature, information on their products, and hold meetings for practitioners. The friendship thus cultivated, justifies the expense.

I can tell you how the principals of our company expressed it when they hired me. They wanted a veterinarian with a number of years of large animal experience. They were looking for the point of view of the veterinarian in the field. Coupled with their own strictly nutrition point of view, they felt that they would get a much greater depth of vision with this dual look at a single problem. A kind of stereoscopic effect—3D, with greater depth of vision, than the sum total of two different points of view.

Feed manufacturers are trying to do a good job. The larger feed companies have well-trained nutritional and scientific staffs. The smaller manufacturers get their guidance from the nutritional and scientific staffs of reliable vitamin producers, and private consultants. Formulas are carefully prepared, ingredients are the best available, and the mixing is closely supervised. State laws help in the maintenance of quality and give assurance of the reliability of the guarantees.

We do not have to be told of the high quality of our veterinary service in this country in the fight against livestock diseases.

Since both groups are working for the same interest, the good of the livestock industry, it behooves both groups to cultivate each other, and meet on common ground for the benefit of all concerned. There are healthy signs of progress; however, much remains to be done.

Medicinal Therapy In Canine Otitis Externa†

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IT is well established that some breeds of dogs, by virtue of their conformation, are predisposed to ear trouble. Long, pendent ears hang down over the external auditory meatus, thereby inhibiting the circulation of air within the canal proper. Ventilation is impaired further in breeds such as the Cocker Spaniel, and Springer Spaniel with pendent ears that are heavily haired. The long-haired terrier breeds, the Sealyham, Welsh Terrier, and Kerry Blue Terrier, are predisposed by an extensive hair growth within the canal. This hair not only inhibits the circulation of air in the canal but also interferes with the expulsion of desquamated epithelium and cerumen. Many cases of otitis externa could be prevented by periodic removal of excessive hair growth and removal of accumulated cerumen and debris.

There is another group of factors involved in otitis that might be called activating factors. Foreign bodies of various and sundry kinds frequently are causes of otorrhea. Weed seeds, awns, and grasses are encountered frequently during the months of the year when the ground is not snow-covered. Children's activities are such at times that they may "lose" small objects in the ear canal of the dog (as well as in their own ears and nose). They may roughly insert pencils, sticks, bobby-pins and other objects into the ear canal withdrawing them as the dog evidences pain. The damage, however, has been inflicted in that the sensitive lining of the ear is traumatized. Dirt and soap frequently are activating causes of otitis. Inspissated cerumen may accumulate in such quantity as to act as a foreign body. Parasites, for example *Otodectes cyanotis*, the ear mite; ticks and occasionally fleas, lice, and mange mites cause auricular irritation. The extension of inflammatory processes from adjacent tissues such as occur in mange or dermatitis may result in otitis. Faulty cleansing, bruising or the long retention of previously used drugs, especially powders, may be responsible agents. Infection is observed commonly in infectious diseases such as canine distemper. Any generalized disease process, whether it be an infectious disease, non-infectious disease, or malnutrition may cause devitalization of epithelial structures. Such conditions are commonly accompanied by or followed by otitis. The retention of water within the ear canal favors the maceration of surface cells of the epithelial lining. The deeper tissues then are exposed to infection. Bacteria and fungi of the opportunist type are always present. Staphylococci are found frequently in otorrhea. *Staphylococcus aureus (Micrococcus pyogenes* var. *aureus)* is the most common bacterial invader of irritated ears. Streptococci, *Pseudomonas aeruginosa (Bacillus pyocyaneus)* and *Escherichia coli* are also common bacterial invaders. Certain of the fungi are also opportunists in nature and may prosper in devitalized epithelial tissue, especially if moisture is present.

A classification of otitis on the basis of pathology is helpful in discussing this subject. By such means exacting terminology descriptive of the lesion can be used. There are,

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however, advantages in classifying otitis externa as regards the duration and extent of the condition. Peracute otitis, acute otitis, and chronic otitis have been chosen for discussion in this paper inasmuch as the treatment phase of otitis is to be considered primarily.

Peracute Otitis

Peracute otitis externa is characterized by a hyperemic, somewhat swollen and sensitive, aural epithelium. Exudation has not yet occurred or is just beginning as a serous-like discharge. The animal may shake the head and frequently scratch at the ear. He may rub the affected ear or appreciate having it massaged mildly. If a large or sharp foreign body is present however he may resent one's attempt to examine the ear. If only one ear is affected the animal may rotate the head, holding the affected ear down. As the inflammatory process proceeds, the ear becomes more sensitive and the vigor of self traumatization is decreased. Wounds, bruises, parasites, and foreign bodies in particular should be given consideration when examining the ear.

A gross initial examination is usually made with the unaided eye. Inflammation of the ear is painful and should not be treated indifferently but with sympathy and consideration to prevent unnecessary suffering. The owner, or preferably a trained assistant, steadies the head and muzzle of the dog. It is often necessary to restrict the movement of the body and limbs as well. This can be accomplished best by having the assistant stand on the opposite side of the table grasping the muzzle with the hand nearest the dog's head, using the other hand and arm to restrain the body by pressure downward against the table or by firmly pressing the dog against the assistant's body. These basic restraint maneuvers are mentioned because it is vital that the animal be restrained properly and further that he cooperate to the fullest degree if the examination and treatment are to be carried out safely and efficiently. The ear should be grasped in the distal half of the conchal portion and held gently but firmly. It is then extended outward, upward, and slightly posteriorly. When held in this position the ear is well exposed for examination. With the aid of a good, direct light, a thorough examination of the outer portion of the ear is readily accomplished. If the causative factor or the lesion is not readily discernible, the illuminated otoscope should be employed for a more extensive examination of the canal proper. Dexterity in the use of the otoscope is highly desirable.

A long speculum aids one in examination of the deeper portions of the canal and the tympanic membrane. The speculum should be large enough to provide maximum visibility and working space but yet small enough to be inserted without injury to the canal wall. The end or tip of the speculum should be perfectly smooth and free from any jagged or sharp surfaces or edges which might traumatize epithelium. A thin film of lubricating jelly applied to the exterior surface of the speculum facilitates easy, non-painful use of the otoscope. The use of a jelly in which is incorporated a bactericide and local anesthetic is recommended. If slight local pain is evidenced either upon gross examination or upon the insertion of the otoscope a few drops of a topical anesthetic solution, such as 2% pontocaine®[1] or 1% ophthaine®[2] may be applied in this type of otitis. Topical anesthetics are usually unsatisfactory if discharges are present. If these measures prove inadequate or the animal is intractable, a short-acting general anesthetic should be employed before proceeding further.

Foreign bodies found upon examination are removed easily by means of alligator forceps or a wire loop. The ear is cleaned, if need be, and any wound accorded the treatment deemed advisable. A few drops of auralgan®[3] then are instilled into the affected ear. This agent rapidly brings about relief of pain and visible inflammation by its decongestant, somewhat dehydrating, and analgesic action. Most cases of this type require but a single application.

Acute Otitis

Acute otitis externa, in this paper, embodies those conditions referred to by Witter[3] as ceruminous external otitis and suppurative or purulent external otitis. This is the type of otitis most frequently observed. It is characterized by an active inflammation of the ear canal, accompanied by varying amounts of cerumen and/or exudate. Pain is always present in some degree. Affected animal frequently shakes the head and holds the head tilted to the side with the affected ear down. Scratching at the ear may be accompanied by whimpering, especially if a concomitant, acute, moist dermatitis has occurred at the ventral aspect of the external ear. A distinctive odor often is present.

®[1]Winthrop-Stearns, Inc., New York, N. Y.
®[2]E. R. Squibb & Sons, New York, N. Y.
®[3]Doho Chemical Corp., New York, N. Y.

Successful treatment depends upon first, the removal of any inciting factors that may still be present and a thorough cleansing of the ear with a minimum of irritation. Often the owner, and occasionally the attending veterinarian, is responsible for the prolongation of ear trouble in the dog by insistence in cleaning the ear with irritating substances or by the improper use of cleaning aids. The external ear canal of the dog is relatively long, (too) narrow, and unfortunately tortuous, making cleaning without irritation difficult. Complete cooperation on the part of the dog and adequate restraint are basic necessities for gentle and complete cleaning of the dog's ear. It is frequently advantageous to administer a general anesthetic for this procedure. The intravenous use of surital[®][4] sodium or pentothal sodium is very effective. The anesthetized subject is placed in lateral recumbency with the affected ear up for cleaning. The ear is supported in essentially the same manner as previously described for the unanesthetized dog. If drainage following cleaning or treatment is desired the dog may be allowed to lie with the affected ear down while recovering from the anesthesia.

The first step in cleaning the ear is to trim away all hair in the external portion of the canal. This can be accomplished most easily by using a pair of small, curved, blunt scissors. Clippers are used to trim away the hair in the area around the external meatus and, if indicated, the hair is removed from the inner surface of the pendulous ear flap.

Cotton tipped applicators then are used to remove cerumen and debris from the external portion of the ear or auricle. A small, soft, cotton swab or cotton tipped applicator properly handled is useful for this purpose. Improperly used, the swab or applicator may be a veritable weapon. The cerumen and exudate in the canal proper is not disturbed at this stage of the cleaning process. The applicator is grasped with the thumb and forefinger at the end of the non-tipped portion. The third finger is placed below the index finger as a guide. By holding the applicator in this manner there is little chance of gouging the ear. If the animal makes an unexpected movement the applicator easily slips out of one's grasp. Gentleness and care in cleaning are essential. It is a process that can not be hurried or roughly performed. If in removing cerumen it is noted that inspissation has occurred, it is helpful to dampen every third or fourth applicator by dipping it in castor oil. Emollient properties are useful in these instances. The applicators are used with a sweeping like motion always moving in an outward direction. The applicators should not be inserted into the canal proper in the removal of cerumen because of the danger of pushing cerumen or debris down into the canal, forming a plug, and possibly injuring the tympanic membrane. When the external portion of the ear has been thoroughly and prudently cleaned, a wire loop is used to remove debris from the canal. The loop, made of light wire, is grasped in essentially the same manner as is the applicator. The loop is used through the illuminated otoscope. Care should be exercised in the use of the loop to avoid puncturing the tympanic membrane. There are instances in which, because of the presence of copious quantities of purulent exudate or when the lining is extremely sensitive and highly inflamed, these methods may not be entirely satisfactory. In such cases washing and flushing may be found very useful.

After thorough cleansing, little if any further treatment is necessary in many of the cases characterized only by excessive cerumen accumulation.

The next step in the therapy is the use of an agent to reduce or prevent weeping. This therapy is indicated in the acute, moist, seeping ear and is not primarily directed at controlling infection. Two types of preparations may be found useful. First, an astringent solution containing salicylic, boric, and tannic acids, alcohol, and propylene glycol (sal-bor-tan)[®][5] is of such a fluid nature as to contact easily and quickly all portions of the ear. If perchance an excess is instilled, it will run out easily or be expelled when the animal shakes its head. This type of preparation should be instilled a few drops at a time, three times each day.

A second type of preparation is pellene[®][5], an absorbent, sedative, and anodyne lotion. This lotion readily flows into and around in the various portions of the ear. It is best applied once a day in limited quantities. The bulk of any residue or discharge should be removed from the ear before further applications are made.

The next step in the treatment of acute otitis externa is the use of drugs to prevent or combat infection. The two therapeutic agents just mentioned often are sufficiently bactericidal and fungicidal to prevent infection. If, however, infection has occurred as manifested

[®][4]Parke-Davis & Co., Detroit, Mich.

[®][5]Pitman-Moore Co., Indianapolis, Ind.

by a purulent discharge other measures are indicated. The use of antibiotic ointments or solutions usually will combat the infection effectively. Sulfonamide preparations are also effective. Combinations of antibiotics and sulfonamides, as prepared for use in bovine mastitis, are convenient to use and often highly effective. Persistent cases not responding satisfactorily to the aforementioned types of therapy should be given further consideration as will be discussed in connection with chronic external otitis.

The last point to be considered under acute otitis is proper ventilation. We have mentioned the removal of hair from within and around the external meatus. This in itself is of prime importance in assuring proper ventilation. In regard to medication, it is much better to instill small amounts of the medicament frequently rather than to instill a copious quantity in a single daily dose. Large quantities of medicaments in the ear may limit ventilation in or even occlude the canal. Pendent ears should be taped over the head in most cases. A few individuals seem to have an irresistible urge to scratch at the affected ear. Sedation, the application of an Elizabethan collar, or the application of tape hobbles will prevent the animal from further self-trauma.

Chronic Otitis

Chronic otitis externa is characterized by persistent inflammation of the aural epithelium. The sebaceous and ceruminous glands exhibit a marked increase in activity; the discharge often being quite copious. A fetid odor becomes noticeable as the quantity of purulent material increases. Ulcers often-times are observed upon removal of the discharge, as is a thickening of the epithelium and associated tissues. This type of otitis is second only in frequency of occurrence to the acute type just discussed. It virtually goes without saying that the vast majority of chronic otitis externa is an aftermath of sheer neglect or improper treatment of acute otitis externa. Overtreatment either by repeated irritation of the ear through faulty cleaning methods or by the prolonged use of subclinically effective or irritating drugs may result in the establishment of the chronic stage.

As in other types of otitis, those individuals with long pendent, heavily-haired ears are affected most frequently. Proper ventilation is a necessity in treatment. The hair in and around the external meatus is removed in the manner previously mentioned. Many of these cases of chronic purulent otitis have been treated repeatedly with various and sundry preparations and yet have failed to respond to therapy in a satisfactory manner. A determination of the therapeutic sensitivity of the infective organisms may be extremely helpful in the management of these cases. This determination is made in the following manner. A sterile swab is dipped into the infected pus. The pus and bacteria contained are then streaked directly onto a nutrient or tryptose agar. Next, several sterile paper discs containing known amounts of the more commonly employed antibiotics, sulfonamides, or other therapeutic agents are placed at various spots on the inoculated plate. The plate is then incubated at body temperature for 24 hours, after which time the tests are read. The relative sensitivity of the infective microorganisms to these therapeutic agents is determined by noting the width of the zone of inhibition of bacterial growth around the disc. Three concentrations of each therapeutic agent are available, thus indicating if the organism is extremely sensitive, moderately sensitive, slightly sensitive, or resistant. With proper interpretation, the bacterial susceptibilities as determined by this method should give the clinician a qualitative *in vitro* measure of sensitivity equal to that of any procedure with less effort and often without the added time necessary for pure culture isolation as in the test tube method. This is a rapid, practical, and clinically accurate means of determining the relative sensitivity of microorganisms to therapeutic agents and is especially valuable in selecting the drug effective against chronic or persistent infections refractory to primary therapy.

The ear must be cleansed with a minimum of trauma, dried, and kept free of exudate. Washing and flushing is an excellent method for effectively and easily cleansing the ear. Phisohex[®3] or liquid germicidal detergent[®4] is diluted with equal parts of warm water. With the anesthetized patient in lateral recumbency, the affected ear up, the conchal flap is stretched upward at about right angles to the table and a small amount of the cleansing solution is poured into the ear. The canal is then massaged from the outside with the thumb at the base of the ear. The canal always should be massaged away from, that is lateral to, the tympanic membrane to avoid the possibility of injury or of spreading infection to the middle ear.

Either of two aids will be found useful in aspirating the cleansing solution and the loosened debris out of the ear. A one-ounce all rubber ear and ulcer syringe may be used

conveniently. Another piece of equipment which is even more effective and convenient is the suction (filter) pump to which is attached a piece of rubber tubing and the glass portion of an eye dropper. The pump of course must be attached to a water faucet. Two lengths of glass tips are available. The longer is to be preferred. It may be used through the illuminated otoscope without danger of shock to the operator or patient. The ear may be sucked relatively dry in this manner. Further drying is not necessary. One may lightly "blot" the ear with a cotton tipped applicator if desired.

Enzymatic Debridement

A discussion of cleansing of the ear would not be complete without mention of enzymatic debridement. It is sometimes amazing how rapidly an ear afflicted with persistent otitis will fill with exudate after thorough cleansing. This is disadvantageous from three standpoints: First, it interferes with phagocytosis; second, it interferes with drug action; and third, it fosters the growth of bacteria, which in turn may be carried to adjacent portions of the already afflicted ear. Consequently if this pus can be effectively lysed, one's therapy may be enhanced. Dornavac®[6] a brand of pancreatic desoxyribonuclease, and varidase®[7] a brand of streptokinase-streptodornase, are two lysing agents. Aqueous and saline suspensions of these enzymes have been used in otitis externa with varying degrees of success. Some of the antibiotics have been combined with these enzymes to advantage. The results from this type of therapy have been encouraging in that the antibiotic makes immediate contact in the area of lysis and dissolution and healing may be more rapid. Favorable reports have been given following the use of streptodornase with carboxymethylcellulose jelly[1].

Thorough cleansing of the ear should be followed with effective therapeutic agents and adequate ventilation insured. The drug of choice, as indicated by the sensitivity tests, then is instilled. The use of light antibiotic ointments is preferred. Liquid preparations often do not remain in contact with the affected areas long enough for full therapeutic action. Heavy ointments may not warm and liquefy sufficiently to flow around and contact all of the portions of the ear. Discretion is advised in the use of powders. A light dusting may be effective in the absence of pus. An excess quantity of powder in the canal may, however, cake and act as a foreign body; a source of further irritation. Regardless of the therapy employed small, frequent instillations are to be preferred over massive, infrequent instillations. In this manner the drug is kept in constant contact with the affected areas and yet a large quantity does not accumulate to occlude the canal and hinder circulation.

Taping the ears over the head is recommended in all cases with long, pendent ears. The trapping of exudate within the ear canal is to be avoided. Proper ventilation is a necessity.

Summary

In all cases of otitis, cleansing agents and medicaments are less irritating and better received if they have previously been warmed to body temperature. Overtreatment can be hazardous and should be avoided. The four essentials in the medical management of ear conditions are removal of predisposing factors, in-so-far as that can be accomplished, prudent cleansing of the ear, appropriate medication, and adequate ventilation.

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Air Conditioning in Pet Animal Hospitals

The Committee on Hospital Buildings and Equipment of the American Animal Hospital Association, undertook, among other items for study, a survey of facilities for air conditioning in member hospitals. A questionaire was directed to sizeable sample groups in various sections and results were tabulated by sections.

In the north and central states, more than 50% of hospitals reported having some type of mechanical air conditioning; in the South, 80%; Canada, 30%; California and Northwest, 50%.

More than 90% of those answering replied affirmatively to the question of whether it was considered essential to provide for complete air conditioning if new hospitals were to be built.

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The present may be designated as the chemical age.

[6]Sharpe & Dohme, Inc., Philadelphia, Pa.
[7]Lederle Laboratories Division, Pearl River, N. Y.

Two Cases of Plasmodium Relictum Infection in Domestic Pigeons in the Sacramento Area

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Among the protozoan diseases of domestic poultry, one which is not commonly considered as a problem in the United States is that of malaria. On the other hand, various plasmodia are found quite commonly in wild birds of various species. Some of these have been reported to be transmissible to some of the domestic poultry species, such as *Plasmodium hexamerium*, whose transmission into ducks and turkeys was reported by Manwell[1]. Coatney[2] reported the finding of *Plasmodium relictum* in doves and a pigeon. This organism could be transmitted to pigeons and to chickens. Recently, in the Sacramento area of California, two cases of avian malaria in pigeons, caused by *Plasmodium relictum*, were found.

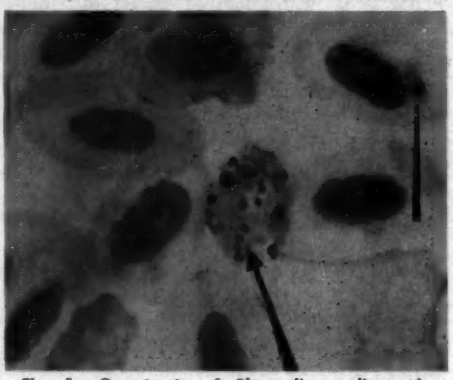

Fig. 1. Gametocyte of *Plasmodium relictum* in pigeon blood. Note round pigment granules (arrow), and early stage of parasite (pointer).

Case 1. A dead Homing pigeon from a loft in Sacramento was brought to the author on behalf of the owner by a pigeon fancier. The bird had been sick a few days and was found dead in the morning. The liver was enlarged, extending about an inch beyond the sternum. The spleen was enlarged about three times. Both liver and spleen were dark brown in color, with a slightly greenish tinge. The lungs were brownish in color. Blood taken from the heart was rather watery in appearance. Smears made of heart blood and impression smears of the spleen were found to have intracytoplasmic bodies in the erythrocytes, staining blue and red with Giemsa stain, which were evidently plasmodia. Both sexual and asexual stages were round in appearance, often displacing the nucleus of the host cell. Gametocytes had round pigment granules. According to the key given by Hewitt[3], the organism was identified as *Plasmodium relictum*. An attempt was made to pass the organism to two two-week-old chickens without success.

Case 2. The pigeon fancier who had brought the bird in case 1 examined, on the advice of the author, his own birds for evidence of enlarged livers by wetting the belly wall with alcohol. This loft was about four miles from the loft in case 1. He found two such birds with enlarged livers, nestmates about three weeks old. One bird died on the way to the laboratory. It was found to have lesions similar to those of the bird in case 1, and to have malarial parasites of the same species. Blood of the live squab was examined and found to contain many parasitized cells. Blood from this bird was inoculated into a pigeon and three chicks. Blood smears from the pigeon taken three days after inoculation were positive for malarial parasites. Blood from this experimental pigeon was inoculated into a canary intramuscularly and into three chicks (two intravenously and one intramuscularly). Blood smears of one chick (i.v.) taken three days after inoculation were positive for malarial parasites. The canary was positive after approximately one week.

Discussion

Although malaria in pigeons in the United States is thought to be a rarity, according to Levi,[4] and although Coatney's[2] report of *Plasmodium relictum* in the pigeon is the only one in the United States, it would seem that perhaps this paucity of reports is due to the habit of pigeon fanciers of killing sick birds without obtaining an accurate diagnosis of the cause of the disease. The finding, in the present instance, of the parasite in birds from lofts several miles apart suggests that there may be more disease of this type in pigeons than is realized.

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The Use Of A Truss In Paraplegia Of The Dog

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THIS is a preliminary report on the use of a truss in posterior paralysis of the dog due to trauma to the vertebral column.

Since the spinal canal of the dog is small, the slightest deviance in apposition of the vertebrae, *e.g.* fractured vertebrae or ruptured intervertebral disks, results in pressure on the spinal cord and often paralysis from that point posteriorly. Aside from surgical procedures, method of treatment commonly employed includes rest, quiet, salicylates or other

Fig. 1

analgesics, and sedatives. During the convalescent period the patient is almost helpless. Most will drag themselves about with the front legs. Abrasions and decubital ulcers are common sequelae. Adding to the unpleasantness is the frequently accompanying urinary incontinence and fecal constipation necessitating catheterization and special dietary regimen. Many of these animals never recover, therefore they face a life of paralysis if their owners do not choose to have euthanasia performed.

Recently, selected cases have been cured completely or helped materially by the use of a truss. Using the same principal as similar human cases, the truss brings the vertebral column into proper alignment permitting the lesion to ankylose with the spinal canal in approximate normal position with no pressure on the nerves.

This truss was used initially when a designer of human surgical garments presented her dog at the veterinary hospital with a tentatively diagnosed condition of a ruptured intervertebral disk. Doctor Swarts suggested she design a truss for the dog similar to those used on human patients. The designer, Mrs. Pearl Walsh of Sturgis, Mich., designed and made a crude model of the truss now in use and submitted it for approval. Mrs. Walsh was willing to try the truss on her dog. The dog was a three-year-old, male Beagle which had been injured two weeks previously. Paralysis was complete and accompanied with much pain on movement. Immediately after application of the truss, the dog was able to walk. This dog recovered completely after wearing the truss ten days. Such gratifying results prompted the designer to refine the truss with the view toward commercial production.

The truss illustrated (fig. 1, 2, & 3) is made of a medium canvas material. Leg bands which pass under the rear legs are elastic and adjustable. Across the top are fastened several straps which are also adjustable. The truss laces down the front. (Fig. 2). On each side parallel to the spine and approximately four inches from the midline are web pockets into which may be inserted aluminum stays the length of the animal's body. The truss in no way interferes with urination or defecation in either the male or female. Although adjustable for size, it has been found necessary to have different sizes to avoid the lateral deviation along the spine when applied. The elastic rear leg bands, as well as the fasteners along the back, should be tight. The front lacing is of less importance. It is planned to eventually make available five sizes. At present three sizes have been made which have been standardized as to length measuring from the point of the shoulder to the first coccygeal vertebra.

There has been limited clinical investigation on the use of the truss due to low incidence of the condition in this practice. To date the truss has been used on nine cases. Case histories follow:

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Fig. 2

Case 1. The previously mentioned case of the designer's dog which walked immediately and recovered completely in ten days.

Case 2. Female Cocker Spaniel. Tentative diagnosis—ruptured intervertebral disk. Injured two weeks earlier, exhibited posterior paralysis and occasional slight pain when moving. The dog recovered completely after wearing truss ten days. This dog walked, played, and negotiated stairs three days after truss had been applied.

Case 3. Four-year-old, female Cocker Spaniel. Had been injured for about one year. Posterior paralysis without pain. The dog was able to walk with the truss after five days. Complete recovery in two weeks.

Case 4. Ten-year-old, female Dachshund. Tentative diagnosis—fracture and dislocation of lumbar vertebra. Injury of five years' duration incurred when a child jumped on the dog. The dog exhibited pain in the hind quarters. This bitch would fall after walking only a few steps. If she curled up at night, she would howl in pain and the owner would have to get up and move her to relieve the pain and quiet her. The second night after application of the truss, the dog rested through the night. Ten days after application practical recovery was effected. Five weeks after the truss was first put on it was removed during the day and applied at night only. This dog is slightly awkward in some daytime activities. No further improvement seems likely.

Case 5. Seven-year-old, male Pekingese. Injured 5½ years; exhibited posterior paralysis. On occasion dog could stand on hind legs for short intervals. There was no pain. Three days after application of truss, dog showed evidence of pain in hind quarters and hind legs began to twitch. On the fifth day the owner removed the truss because of the pain. Pain persisted for three months.

Case 6. Four-year-old, male Cocker Spaniel. Tentative diagnosis—ruptured intervertebral disk. Dog was injured 24 hours earlier and was presented exhibiting partial paralysis of the hind quarters associated with great pain. The truss was worn for 12 days. The animal now walks with a slight stiffness.

Case 7. Seven-year-old, female Dachshund. Tentative diagnosis—ruptured intervertebral disk. The onset of the injury was gradual over a seven- to ten-day period. Paralysis was complete in hind quarters. After wearing truss for one week no improvement was evident although walking appeared normal while wearing the truss. After a second week the dog could stand when the truss was removed. Clinical recovery was effected in a total of four weeks.

Case 8. Eight-year-old, male Dachshund. Tentative diagnosis—ruptured intervertebral disk. The dog had been injured for one month, was clumsy and in pain, but was not paralyzed. At the latest report (two weeks), the animal was normal with the truss in position and could climb stairs fairly well without it.

Fig. 3

Case 9. Four-year-old, male Cocker-Boston cross. This was definitely diagnosed as a case of deforming arthritis by another veterinarian and had been undergoing treatment of 10 mg. cortisone daily for one year. The dog moved with great difficulty and carried the sacrum and tail in a ventral position. The truss was applied, which forced the sacrum and tail dorsally. Pain was caused by this correction and its use was not deemed advisable.

Discussion

Clinical results have been variable. Relief was afforded patients that suffered various de-

grees of paresis for lengthy periods. Diagnoses when made were tentative, and not confirmed by radiography. *X*-ray diagnosis may be expected to aid the selection of cases in which the truss may be expected to bring about desired results. Difficulties attended early diagnosis of a disk injury by *x*-ray technic. Cases of long standing (two weeks or more) present fewer difficulties and can be visualized with careful technic.

Length of time truss must be worn varies considerably. The following is the general rule applied: First week—truss on all the time; second week—truss off one half of the day time (worn during the night); third week—truss off during all the day time. Times for wearing the appliance must be varied by the clinician as progress warrants and as healing progresses. If no improvement is effected after seven to ten days, no benefits are likely. Salicylates as indicated are recommended.

Summary and Conclusion

It is believed that the truss can be put to good use in disk injuries, some vertebral fractures, selected cases of vertebral dislocations and disorder of the sacro-iliac junction.

The use of a truss in posterior paralysis due to trauma in the dog is discussed. It has been described and nine case histories are presented. Results have been variable although most have been good. Although the truss is by no means a cure all, it is felt that with more experience as to the type of condition to which it should be applied, its usefulness will be established.

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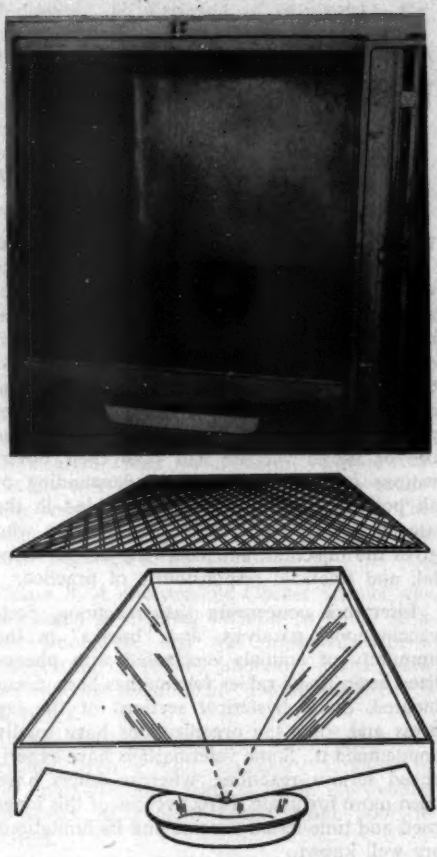
Specimen Collection Unit

In order to make a differential diagnosis, the veterinarian must bring his examining room problems into the laboratory. A useful and practical aid in careful laboratory diagnosis is a portable unit for collection of urine and fecal samples.

Such a collection unit can be constructed easily to fit any ward cage and saves time, labor, catheters, and loss of samples. Patients entering a hospital can be placed directly into the cage containing the collection unit. Then if elimination occurs prior to routine clinical collection of samples, specimens are not lost.

The portable unit can be dissembled easily for thorough cleaning. It is essential that such a unit be kept absolutely clean, otherwise contamination of samples will result. Hair and other debris can be removed from urine samples by filtering through cotton.



Photograph of cage fitted with collection unit (upper). Diagram of Specimen Collection Unit, measurements to fit selected cages (lower).

Any metal worker can construct the collection unit pictured above. Wire of ⅜ in. expanded metal and 14-gauge is recommended for the top of the unit. The metal bottom of the collection unit that holds the wire insert can be made of 24-gauge metal. Any low pan that can slip under the unit is satisfactory for urine collection.

Dr. Mark L. Morris, who owned and operated the Raritan Hospital for Animals at New Brunswick, N. J., adapted the unit for hospital use from metabolism cages used in laboratories for nutritional studies.

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A total of 58,000,000 quarts of fresh milk and cream are distributed to consumers daily by doorstep delivery or through stores.

A Practitioner's Experience With Rabies Vaccines

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THE following is presented purely as the results of one practitioner's experience with rabies vaccines. It is not intended as a scientific dissertation on the degree of immunity conferred by one vaccine over another, or to evaluate different types of products. As the scope of this article is limited to the local experience of one man, it is hoped that other practitioners having wide experience in the use of rabies vaccine will pool their observations in order to clarify understanding of all possible side effects to be avoided in the use of any type of vaccine by the man who gives the injection, and bears the moral, mental, and financial responsibility of practice.

Literature concerning side reactions, postvaccinational paralysis, and "breaks" in the immunity of animals vaccinated with phenolized brain tissue rabies vaccine has been documented. Some hysterical sections of the lay press and some lay organizations have totally condemned it. Some veterinarians have experienced serious reactions, whereas others have been more fortunate. Effectiveness of this long-used and time-tested vaccine and its limitations are well known.

Numerous articles have appeared in current veterinary literature expostulating the virtues, effectiveness, and safety of rabies vaccine cultured on embryonating chicken eggs. To date, current writings concerning side reactions and unfavorable results have been conspicuous by their near absence[1,2]. Hundreds of thousands of doses of the product have been used without serious reactions. A near perfect product has been produced—a product that, in an animal organism, does a specific job regardless of age or condition of the animal without serious untoward effects—the err factor has been abolished, or untoward and unfavorable reactions are not being reported by practitioners for fear of being thought "nonprogressive" or through sheer inertia. To "sheer inertia" the author pleads guilty.

The following is not an attempt to evaluate the benefits of tissue vaccine over egg cultured or the converse. It is a practitioner's experience with both types of vaccines over a period of ten years. Controls have not been run, dogs have not been challenged, and the diagnosis of state department of health laboratories have been accepted as final.

Records on 15,000 Dogs

Between the years 1944 and the present date, the writer has administered approximately 15,000 doses of tissue vaccine subcutaneously to dogs. Of this group, 2,100 animals were vaccinated while on duty with the United States Army Veterinary Corps. These dogs were given triple injections of tissue vaccine at seven-day intervals, the amount depending on their size; 2, 3, 5 cc. for small; 3, 5, 10 cc. for average; and 5, 10, 15 cc. for large dogs. Of this group, there was not one case of a postvaccinational paralysis. There were two cases of abcesses. Both dogs abcessed on material withdrawn from the same bottle of vaccine.

In civilian practice, the 5 cc. subcutaneous injection of rabies tissue vaccine has met with excellent results. In 8,700 doses given between May 1950 and August 1954, there were no cases of post vaccinational paralysis. There were seven scattered, postvaccinational abcesses. Three dogs contracted and died from rabies in less than 12 months following vaccination. Case reports on these follow:

Unfavorable Sequelae

Case 1. Black, male Cocker Spaniel, six months of age. Rabies tissue vaccine (5 cc.) was injected subcutaneously in December 1951. The animal was presented in October 1952 with history of having been bitten by a stray dog. Death in four days after admission. Brain was positive for Negri bodies.

Case 2. A four-month-old mongrel, male pup (Virginia law locally requires vaccination at four months of age) was given 5 cc. of tissue vaccine subcutaneously in May 1952. In January 1953 the dog was presented with typical symptoms of dumb rabies. There was

no history of bite, but rabies was prevalent in the area and the dog ran loose. Death occurred 48 hours after admission. The brain was positive for Negri bodies.

Case 3. A five-month-old female Collie was immunized with 5 cc. rabies tissue vaccine in June 1952. In December of 1952 a stray dog bit her. A week after being bitten, this animal began to exhibit signs of dumb rabies. Death occurred two weeks after being bitten. The brain was negative for Negri bodies. No seriological tests were made.

There also were several cases of the immunity lasting for a period of more than 12 months as revealed by the following case histories:

Case 4. Three male Pointers were immunized in April of 1952 with 5 cc. tissue vaccine subcutaneously. They were bitten by a rabid dog in November of 1953. The dog that bit them died and the brain was positive for Negri bodies. The three Pointers were presented five days after being bitten and were apparently normal. They were hospitalized 15 days for observation. At no time was their behavior abnormal. Upon discharge 5 cc. tissue vaccine was injected subcutaneously. These three animals have since remained normal.

Case 5. A 14-month-old Chesapeake Bay Retriever was given 5 cc. rabies tissue vaccine subcutaneously in June 1952. The dog was bitten in October 1953 by a dog that died within 48 hours after the fight. Laboratory confirmed diagnosis. The retriever was quarantined for 15 days and was discharged as apparently normal and has remained so. The dogs in cases 4 and 5 may have been naturally immune to rabies.

Rabies tissue vaccine, in small animal practice, has been satisfactory in the writer's experience. In the field, 10,800 dogs have been immunized. Three died of rabies in less than 12 months following vaccination, nine developed post postvaccinational abcesses, and four survived field challenge more than 12 months after being immunized. There has not been one case of postvaccinational paralysis.

The writer's experience with chick embryo cultured rabies vaccine has been limited to the use of 2,080 doses. In March of 1952, the local health department specified the use of avianized® rabies vaccine (A.R.V.) in clinics to aid in controlling a local epidemic of disease. In a period of two weeks, the author and his colleagues gave 3,665 doses in clinics. The only requirement was that the dog be at least four months of age. In the hospital during this period, 870 dogs were immunized with the same product. In clinic groups, some side reactions were noted.

Case 6. A nine-year-old male terrier cross presented four days following injection of 3 cc. chick-embryo cultured vaccine intramuscularly in a clinic. Temperature 105 F. Dog unable to stand, refused all food. Antibiotics and intravenous feeding administered for eight days, with complete recovery in 30 days.

Case 7. A seven-year-old male Great Dane was immunized at one of the clinics. This dog had been vaccinated previously with tissue vaccine annually. This dog was presented 48 hours after clinic inoculation. The owner and his wife carried the dog into the examining room as he was totally paralyzed. The temperature was 104.8 F., anorexia, dyspnea. Death occurred in 36 hours.

Case 8. A one-year-old Cocker Spaniel was vaccinated in a clinic. Within 24 hours after vaccination, the dog was presented with a temperature of 103 F., anorexia, icterus, skin and mucous membrane. Death occurred in 48 hours.

Altogether, 21 dogs suffered various reactions, from a mild, transitory paralysis to total paralysis and death. These represented all stages of general health from poor to perfect.

Dogs vaccinated in the hospital and given an examination that included temperature, fecal examination, and a heartworm check prior to vaccination also suffered from side reactions. All pregnant dogs, dogs under six months of age, over eight years of age, or those suffering from heartworms or intestinal parasites were given tissue vaccine. In the apparently healthy group remaining, 37 reactions were noted by the writer. There may have been more, as some clients would be unhappy and carry the dog to a colleague for treatment if the "shot" the writer gave made him "sick". Naturally this is a two-way street and we received cases from our colleagues' misfortunes.

To group the cases according to severity of reaction and time of onset of symptoms will save time and not detract from the value of the article: Ten dogs, ages six months to one year, were presented within 72 hours after intramuscular inoculation with 3 cc.

®Lederle Laboratories Division, Pearl River, N.Y.

chick-embryo cultured vaccine. Elevation in temperature of 1-3 degrees, anorexia, unsteady, weakened gait were noted in all. All recovered within seven to ten days.

Nine dogs, ages six months to two years, were presented within 72-96 hours following inoculation. Elevation in temperature of 3-4 degrees, anorexia, definite paralysis was noted in all. Hospitalization periods extended from 14 to 21 days. There were four fatalities in this group.

Eighteen dogs, ages six months to six years, presented seven days following inoculation. Elevation in temperature of 2-4 degrees, anorexia for three to four days prior to entrance, dyspnea. Hospitalized 3-5 days. No fatalities.

Of 870 apparently healthy dogs at the time of inoculation with chick embryo cultured vaccine there were four fatalities and 37 known reactions varying in severity.

The following cases are outlined because of problems they present which have not been answered. The facts are true as both owners were well above average in intelligence and integrity.

On December 10, 1953, a six-month-old male, black Cocker Spaniel was examined and vaccinated intramuscularly. On December 30 the dog bit the owner and was taken to a veterinary hospital. The veterinarian diagnosed a clinical picture of dumb rabies. On January 1, 1954 the dog died. The brain was positive for Negri bodies. The local health department started prophylactic treatment with the bitten owner. The dog's brain was sent to another laboratory and a suspension was injected into 15 mice, intracerebral. None of the mice died within 21 days. Diagnosis: Negative for rabies. However, the owner had completed his series of 14 injections.

On April 6, 1954, an eight-month-old female, parti-color Cocker Spaniel was presented. Temperature was noted at 103.6 F. Animal was extremely nervous. History and certificate revealed that chick-embryo cultured vaccine had been injected intramuscularly at Lake Charles, La., on January 15, 1954. A tentative diagnosis of rabies was made, much to the owner's chagrin. Another veterinarian was asked to examine the dog and concurred in our tentative diagnosis. The dog belonged to a childless couple and had never been off the leash or out of the house alone. The couple were recent arrivals in the community. There had not been a case of rabies within six miles of their residence here for at least six months, according to the health officer. On April 11, the dog died after exhibiting symptoms of furious type rabies. The brain was sent to the state laboratory and the report was positive for Negri bodies. A portion of the brain was sent to the Army Medical Center Laboratory in Washington, D. C. Fifteen adult mice were inoculated intracerebrally with a suspension of the brain tissue. One of these died on the first day of observation, presumably from trauma. On the eighth day of observation, a second mouse died and seven others were ill, exhibiting typical signs of rabies. Three of these were sacrificed. On the tenth day of observation, the balance of the animals were either dead or showed signs of typical rabies. Impression preparations were made from the brains of the mice which were sacrificed and examined microscopically. Negri bodies were demonstrated. Diagnosis: Positive rabies. With no history of exposure, with no rabies in the area within 30 days prior to the time the dog died, and the dog having been immunized 76 days prior to death, a reasonable answer could not be given as to exposure. A thorough check with health department officials did not disclose a possible source of infection. Where did the dog contract rabies and why did the vaccine fail?

Summary

The author has outlined his personal experience with both rabies tissue vaccine and the chick-embryo cultured product. In 10,800 dogs immunized with tissue vaccine, there have been nine postvaccinational abcesses, three cases of the immunity not lasting 12 months, four cases of the immunity surviving a field challenge after 18 months, no postvaccinational paralysis, and no fatalities. Of 870 selected dogs vaccinated with chick-embryo cultured rabies vaccine, there were ten that had a weakened febrile reaction, nine suffered from a postvaccinational paralysis, 18 had a mild transitory reaction that required hospitalization, and four died. One dog's immunity was insufficient for protection when challenged by field exposure after 18 months.

One dog developed rabies apparently without contact 21 days after being immunized as evidenced by Negri bodies recovered from the brain, although not substantiated by mouse inoculation.

One dog died of rabies 76 days after immunization with no history of exposures. Diagnosis confirmed by demonstration of Negri bodies and by mouse inoculation.

(*Reference on page 328*)

PUBLIC HEALTH

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Two New Publications on Rabies by the World Health Organization

Expert Committee Report

The World Health Organization has released its second report prepared by the Expert Committee on Rabies (WHO Tech. Report Series no. 82). This report contains the collective views of the international group of experts (below); it does not necessarily represent the official decisions and policies of the World Health Organization. In the United States, it is available through Columbia University Press, New York 27, N. Y. The following are excerpts from the Expert Committee Report dealing with specific measures in rabies control:

(1) Registration, licensing, and taxation of dogs.

(2) Elimination of stray animals.

(3) Restraint of dogs while the control campaign is under way.

(4) Mass vaccination of dogs free of charge.

(5) Provision of adequate facilities for diagnosis.

(6) Reduction in number of wildlife species where these are a reservoir of the disease.

(7) A continual and energetic publicity campaign.

The three basic principles of an operational program are elimination of stray dogs, canine vaccination, and control of wildlife vector populations.

Elimination of Stray Dogs. It has been found that registration or licensing of dogs is an important adjunct to successful control. If properly enforced, this measure rids the area of

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ownerless stray dogs and assures a reasonable dog census. An efficiently conducted program requires the operation of a local pound or humane shelter where stray animals may be kept for a few days and, if unclaimed at the end of that period, should be destroyed humanely. Collection of strays should be carried out by teams of dog wardens and assistants in properly equipped trucks.

Canine Vaccination. The Committee recognizes that the chicken-embryo vaccine (Flury strain) produces excellent immunity in dogs for at least three years following a single intramuscular inoculation (posterior thigh muscles), and recommends the use of this vaccine.

The Committee also recognizes the efficacy of a single dose of nervous-tissue vaccine, and therefore recommends the use of this type of vaccine for mass vaccination of dogs in areas where chicken-embryo vaccine is not available or is impracticable. Potency-tested, nervous-tissue vaccine confers good immunity for one year, and three years after vaccination by the intramuscular route there is still significant protection.

Dogs which have been vaccinated with either vaccine, when under six months of age, should be revaccinated within the first year of life.

Since approximately one month is required for canine vaccines of either type to elicit a maximum level of immunity, restrictive measures (leashing, confinement) for dogs which are involved during an epizootic may be lifted 30 days following vaccination.

With regard to methods which will rid an area of enzootic or epizootic canine rabies, the committee feels that no significant degree of success can be expected unless there is a well-organized, intensified program of mass immunization. This necessitates the establishment and operation of temporary clinic sites strategically located throughout the problem area, as well as a substantial zone surrounding the geographical focus of infection. The program should be directed towards the swift reduction of susceptible animals, and this can be achieved by the immunization of at least 70% of the entire dog population of the area in the shortest possible period.

In rabies-free areas faced by the constant danger of introduction of the disease, continued programs of vaccination should be adopted which would provide for revaccination of dogs every three years with chicken-embryo vaccine or for annual revaccination with nervous-tissue vaccines.

Canine immunization should be made an integral part of all long-range rabies control programs and, as a sound public-health procedure, dog owners should be encouraged to have their pets vaccinated by the time they are six months of age.

The committee again stresses that all vaccines used for immunization should have previously passed an adequate potency test.

Control of Wildlife Vectors. In areas where rabies is present in wild animals such as foxes, wolves, mongooses, jackals, skunks, and coyotes, either alone or with canine rabies, well-organized campaigns for the reduction of excessive numbers of wild-vector populations should be coordinated with an overall control program. It has been observed that outbreaks of rabies in wildlife occur most often in areas where the vector species has reached unusually high population densities, and the objective should be to reduce the number of susceptible animals to a level which would no longer support an epizootic and thereby prevent the danger of its spread to man with his domestic animals. These programs should be directed by experienced or professionally trained predator-control specialists who may utilize trapping, shooting, gassing of dens, and/or poisoning technics best suited to the problem area.

Vampire-bat rabies continues to be the source of a large rabies problem in Mexico, Central and South America. Some progress has been noted in controlling the disease in these areas by eradication schemes which employ dynamiting, gassing and shooting of vampire-bats in their diurnal resting-places.

Handling of Animals Bitten by Rabid Animals. The Committee recommends that dogs and cats bitten by a known rabid animal should be destroyed immediately. If the owner is unwilling to destroy the exposed animal, the following aternatives are recommended:

(1) Strict isolation of the animal in a kennel for six months.

(2) If no previous vaccination has been given within a period of three years with chicken-embryo vaccine, or within one year with nervous-tissue vaccine, administer post-exposure treatment* and confine in a kennel for three months.

(3) If the animal has been vaccinated previously within one year with nervous-tissue vaccine, or within three years with chicken-embryo vaccine, revaccinate and restrain (leashing, confinement) for 30 days.

*Post-exposure treatment may consist of administration of rabies hyperimmune antiserum (0.5 ml. per kg. of body weight) not later than 72 hours after exposure, followed by a single dose of chicken-embryo vaccine within the next seven days, or a course of nervous-tissue vaccine.

Although no experimental evidence is available, the postexposure treatment described in footnote may be applicable to animals other than dogs and cats.

International Transfer of Dogs and Cats. In the first report, consideration was given to preventive measures indicated in the international movement of dogs and cats. In view, however, of the advances in our knowledge of the vaccines discussed in the present report, the Committee feels that certain elaborations now can be made on the recommendations quoted above.

The Committee fully supports the following statement contained in the first report:

The Committee recognizes that countries now free of rabies should continue either to prohibit the importation of dogs and cats, or subject them to a prolonged period of quarantine, preferably six months, at the port of entry. In the case of countries with extensive land borders, and where rabies is already present in domestic or wild animals, it is recognized that such strict quarantine measures are impracticable.

"For this later group of countries the present Committee recommends that: (a) Animals (cats† and dogs) originating in countries where rabies infection is known to exist should be vaccinated more than one month but within 12 months before departure with nervous-tissue vaccine, or within 36 months before departure with chicken-embryo vaccine, both vaccines having previously passed satisfactory potency tests. Animals should be revaccinated with either type of vaccine as soon as possible after arrival. Certificates signed by the appropriate veterinary authorities in the country of origin should accompany each animal. These certificates should identify the animal clearly and should contain a record of the date of vaccination, the vaccines used, lot number of the vaccine, and name of the production laboratory. Where any doubt exists with respect to the potency of the vaccine used in the animals' country of origin, the animal should be considered unvaccinated.

"(b) Unvaccinated animals originating in rabies-infected countries should be vaccinated upon arrival and quarantined for 30-45 days or, where quarantine measures are impossible to apply, the animal should be kept under surveillance for a similar period and not allowed to run at large.

"(c) Unvaccinated animals originating in countries free of rabies, and not exposed enroute, should be vaccinated upon arrival and kept under restraint by the owner for one month.

"These recommendations are made in consideration of the varied conditions encountered throughout the world and should not be construed as discouraging more stringent measures, such as maximum quarantine or restraint periods upon entry. This is especially true where receiving countries are free of rabies, and do not carry out vaccination procedures."

This report is very comprehensive and can be used as a guide in practically any area of the world for rabies control.

Rabies Laboratory Manual

Another excellent publication that the WHO has recently published is a monograph containing a number of contributions by distinguished research workers on various aspects of laboratory technics in rabies. (Laboratory Techniques in Rabies, WHO Monograph Series no. 23) This manual covers diagnostic procedures, vaccine production, vaccine testing, hyperimmune antiserum production, and care of laboratory mice. (Also available from Columbia University Press, New York, N. Y.) It points out that in the laboratory diagnosis of rabies the examination frequently is limited to the tissues of the central nervous system and the salivary glands are entirely overlooked. It has been amply stated that, "animals do not bite with their brains." The real risk of contracting rabies is dependent upon whether or not the virus is present in the salivary glands of the biting animals. Furthermore, this type of information is essential for an understanding of the epizootiology of the disease. Salivary excretion of virus does not occur in an appreciable but only in an unpredictable number of cases where virus can be recovered from the brain of the same animal. Examination of the submaxillary salivary glands for the presence of virus by mouse inoculation therefore should be carried on whenever possible, concurrently with the nervous tissue examination.

The necessity for mouse inoculation tests in routine diagnosis is worth the special emphasis. Careful studies have shown that up to 20% of animals negative on examination for Negri bodies were positive for rabies by the mouse inoculation test. The manual also provides a description of the preparation of the Semple phenolized type vaccine. This is the most widely used of the killed vaccines. This does

†The Committee has no evidence with respect to the duration of immunity conferred by vaccine in cats.

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not imply that other inactivated or living vaccines, such as the Hempt, Hogyes, Fermi or Harris type vaccines, to name a few, are not equally effective, provided they are adequately tested for potency. Detailed descriptions of the production of ultra-violet inactivated vaccine and modified live virus vaccine prepared from chicken embryos are included.

The manual points out that the necessity for performing potency tests on each batch of vaccine can not be too strongly emphasized. Ample experience has shown that even when routine procedures are followed closely in the preparation of successive batches of vaccine there is no automatic assurance of a potent product. Potency tests in laboratory animals including mice, guinea pigs, and dogs provide the only basis at present for any degree of certainty that a vaccine possesses sufficient immunogenicity to give dependable results in human beings or animals. Several potency tests for both human and animal vaccines of varying complexity are given so that a laboratory may select and devise the one most suitable to its conditions and facilities. One part of the manual is devoted to the preparation and potency testing of hyperimmune antiserum. Preliminary investigations of hyperimmune rabies antiserum in experimentally-infected laboratory animals and antibody studies in human volunteers and more recently field use of serum in severely exposed persons have shown great promise in the effectiveness of this product when used in conjunction with vaccine.

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Pyrogen-free parenteral solutions had no apparent effect on the appetites of dogs in experiments by Beamer and Thomas[17] but when pyrogenic organisms or substances were present in these solutions, appetite was decreased.

It was concluded that intravenous feeding of carefully prepared, pyrogen-free solution does not delay return of appetite in convalescing dogs.

[17]Beamer, W. D., and Thomas, J. E., The Effect on Appetite in Dogs of Pyrogenic Substances in Intravenous Infusion. *Gastroenterol* 2:347 (Sept.), 1954.

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(*Continued from page 324*)

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1. Fallon, Harry J., Report on Immunity Failure of Avianized Rabies Vaccine. *Jour. Am. Vet. Med. Assn.*, 120:373 (June), 1952.

2. Stafford, A. L., and Starr, L. E., The Use of Avianized Antirabic Vaccine on a County-Wide Basis. Proc. Book Am. Vet. Med. Assn., 1950, p. 144.

Surgical Relief of Recurrent Urethral Calculi in Cats

A surgical procedure for the permanent relief of recurrent urethral obstruction in male cats is described by McCully.[18]

Hazards of surgery are reduced when selection of patients is possible and when preparation for surgery can be accomplished by dislodging obstruction and keeping urethra patent until general condition is improved. Animal suffering obstruction for 36 hours or longer may be prostrate, are uremic and in shock. Aspiration of accumulated urine through the abdominal wall is recommended in case when obstruction can not be removed safely, and 12 to 18 hours delay of surgery reduces surgical risk.

Surgical technic is referred to as an antepubic urethrostomy. The bladder is exposed through abdominal incision, urethra exposed and severed just anterior to Cowper's glands. After return of bladder to position and initial incision closed, a second incision is made through the skin approximately ¼ in. posterior to the first. Urethra is slit and brought through the latter incision and sutured with silk to the skin margin. Catheter is inserted and left in place for a few days.

Postoperative care includes therapy for relief of cystitis, to prevent skin scalding from escape of urine, and general supportive measures until animal is taking food.

End results are reported to be excellent. Dribbling is no problem as urination is controlled by the sphincter muscle or the neck of the bladder. Operated patient soon changes attitude for nicturation and area around the opening remains relatively dry. Ascending infections have not been experienced and the author claims that natural defenses and valve-like action at the new urethral opening tend to prevent these complications.

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The wheat surplus held by the federal government would provide each family in the United States with 1,400 loaves of bread.—*S.N.L.*

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Declawed kittens or gentle cats make good kennel mates for noisy puppies. —*J. J. Fishler, D.V.M.*

[18]McCully, Robert M., Antepubic Urethrostomy for the Relief of Recurrent Urethral Obstruction in the Male Cat. *Jour. Am. Vet. Med. Assn.*, 126:173 (Mar.), 1955

EDITORIAL COMMENTS

Department of Veterinary Nutrition

Veterinary Nutrition designates a new and added feature in this issue of VETRINARY MEDICINE. This Department, under the editorship of Dr. Morris Erdheim, will appear regularly hereafter and will be designed to treat nutrition of livestock from a maintenance of health aspect.

The aim and objective of this service feature for veterinarians is to provide information practitioners have sought in regard to activities in this rapidly advancing field. The local practitioner, because of his basic training in animal physiology, biochemistry, and related subjects, is the best local authority on matters of nutrition. He must, however, also be acquainted with progress in the field as developed by research for a sound basis for recommendations in individual herds or flocks.

Advancement in the field of animal nutrition during recent years has been phenomenal. The most outstanding example is the record of accomplishments in the broiler industry. Application of research into nutritive requirements of chickens has been the most important single factor responsible for the growth of this industry. Adequate nutrition not only has made it possible to produce an edible frying chicken in a shorter time than formerly but a better one from the standpoint of good flock health and minimum death losses. A second example is lessons learned by research and trials in supplying a better swine growing and fattening ration. Progress in this field certainly can not be rated less than spectacular considering weight at a given age and total feed consumed on today's rations compared with those fed 20 and 40 years ago. In both examples cited, rate of growth and gain is more rapid than ever before with attainment of slaughter weights on less feed. Also, while these gains are being accomplished, morbidity and mortality losses are being steadily reduced.

In spite of advances, losses suffered by the livestock industry are staggering. A considerable portion of these result from improper nutrition. Improved nutrition with better husbandry, disease and parasite control are essential to the existence of a profitable livestock industry producing adequate amounts of quality meat food protein for a rapidly expanding population.

Doctor Erdheim is well qualified to write authoritatively on this subject in which practitioners are vitally concerned and interested.

Biographical Sketch of Doctor Erdheim

Doctor Erdheim was born at Barren Island, N. Y. on January 13, 1917, the son of Abram and Gertrude Tripp Erdheim. He received

Dr. Morris Erdheim

his preveterinary training at Cornell Agricultural College and his veterinary degree from the New York State Veterinary College at Cornell University in 1939. Immediately after graduation, he entered the BAI Meat Inspection Service where he remained for 2½ years, followed by four years of service with the U. S. Army Veterinary Corps. He was discharged in 1946 with the rank of Captain.

After his return to civilian life, Doctor Erdheim established himself for general practice in Grayslake, Ill., northwest of Chicago, where he remained for eight years. His interest in nutrition was stimulated by close contact with nutritionists at the research farm of Allied Mills, located near his practice location, where he performed veterinary service. For a time he also was consultant for Dawe's Laboratories, basic producers of vitamin products for the feed industry, and did field trial work with newly developed products. He joined the Dawe's Laboratories on a full time basis as staff veterinarian in 1954 and recently was promoted to the position of director of technical development.

He has prepared numerous papers on va-

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rious subjects and was among the first practitioners to report on clinical leptospirosis in cattle in the Midwest. Included was a case in a herdsman who apparently became infected from cattle contacts. He also assisted in the preparation of the chapter on Parasites and Disease for Hog Profits for Farmers, written by Dr. W. N. McMillen.

Doctor Erdheim is a member of the American Veterinary Medical Association, Illinois Veterinary Medical Association, American Association for the Advancement of Science, American Dairy Science Association, American Society for Animal Production, American Farm Bureau, past president of the Grayslake Lion's Club. He married Miss Leora Edelman of Chicago in 1940. The Erdheims have two children, a 12-year-old boy and a daughter eight years of age.

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Phenothiazine—Two-Flank Attack on Parasites

Continuous phenothiazine feeding trials at the Mississippi station support previously reported experience when supplied dairy calves.

In a year's study involving 36 animals (20 fed 1.5 gm. phenothiazine per head per day and 16 held as controls) it was determined that all of the untreated calves and less than half of the treated ones harbored egg-producing female worms. Further evidence that this useful anthelmintic reduces pasture contamination was found in observations on viability of parasite eggs, "77% from a control group hatched; but only 1.6% of the eggs passed by the treated group developed into larvae."

Thus, a two-flank attack on "profit stealers" —phenothiazine not only kills adult parasites at their normal habitat as adults but decreases markedly viability of eggs, thus reducing numbers that develop as infective larvae. Furthermore, susceptible parasites have not been observed to develop resistance to this drug up to the present, but are expected to show such activity in the future.

Lush growths of cultivated pasture grasses offer better protection to developing infective worm larvae than most native pastures.

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It is reported that there are at present 70 clinical diagnostic laboratories in Iowa operated by independent veterinary practitioners for assistance in diagnosis of diseases of poultry and other classes of livestock.

A.V.M.A. Annual Convention Minneapolis, Minnesota August 15-18, 1955

Beautiful Minnehaha Falls in Minneapolis, immortalized in Longfellow's poem, "Song of Hiawatha." Minnehaha Park, where the Falls are located, is one of the 143 parks in the city.

A single particle of virus (avian-respiratory) may infect a susceptible bird and have 10,000,000 offspring in a brief period of 24 hours. In this respect its reproductive activity directly influences its ability for adjustment to environment and is approximately equivalent to 10,000 years of evolution of the horse.—*C. A. Brandly, D.V.M.*

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Demodectic Mange in Cattle

(Continued from page 306)

may be introduced into herds; the persistent blemishing lesions in some show animals and in valuable pure bred herds; the great damage to hides from the invasion of mites and, the abscesses. There is still a great need for more research work on the life cycle of this parasite, on new and improved methods of treatment, and more data compiled on the prevalence and economic importance to bring to the veterinary profession and to the farmers the damaging effect from this parasite.

Estrogenic Substances as Feed Supplements

Stilbestrol implants for beef cattle have been studied by a number of investigators. Earliest reports on its use date back to 1948. Results have been consistent and implanted animals responded with increased growth rate and feed efficiency. In many cases, however, carcass grades were lowered as compared with controls fed identical rations less stilbestrol. California researchers, concluded, after trials, that hormone supplementation of cattle on irrigated pasture resulted in no gain, but when these animals received grain in addition to pasture, increases in growth and weight were measurably in favor of the stilbestrol implantation. Disorders have been produced in fattening cattle when excessive quantities of estrognic substances were implanted. However, irregularities were evident in individuals and not in all animas in certain experimental plots.

Oral feeding has gained tremendous support resulting from favorable reports from Iowa State College workers and some others. Observations grew out of studies of the estrogenic activity of certain roughages. Significant growth responses are reported from poor quality roughage when the ration contains stilbestrol in amounts that exceed those found in best quality roughage. This led to further work to determine the optimum daily intake that was safe. Carcass quality is claimed to be uninfluenced by rational use of stilbestrol.

It must be understood, however, that this synthetic drug having estrogenic properties is not a food nutrient. Its action is stimulation of the pituitary gland for production of the growth-promoting fractions. This is indirect action. A second activity suggested, but not supported, is the direct stimulating action of stilbestrol on rumen micoorganisms.

Supplementation of the ration of fattening lambs also appears to influence favorable growth, fattening, and finish in these animals. The practice may prove as useful with lambs as steers. No breeding stock should be allowed access to "spiked" supplements or should open gilts, or pregnant gilts or sows be allowed to follow cattle receiving estrogenic substances.

Much work is underway at institutional and commercial research farms to test further effectiveness and safety of stilbestrol and other similar compounds in an effort to find answers to many problems posed.

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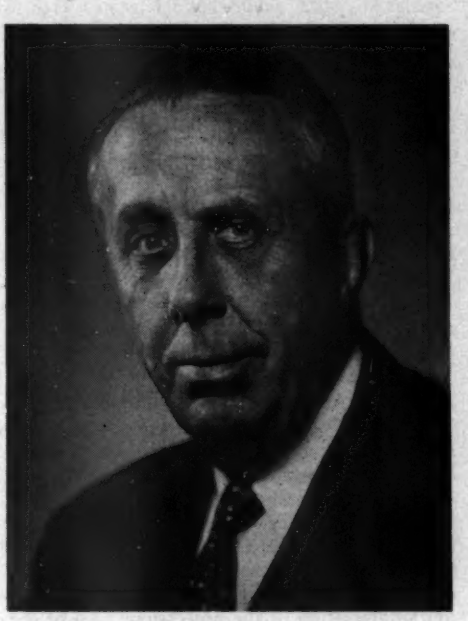
23,453 cases of swine erysipelas were reported in Indiana during 1954.

A Personal Message From the President of the A.V.M.A.

This coming August 15-18, the greatest gathering of veterinarians in world history will be held in Minneapolis, Minn. Members of the A.V.M.A., their wives, and exhibitors will possibly exceed a total registration of 4,500.



Dr. A. H. Quin

It is a waste of words to tell any A.V.M.A. member who has attended this society's meetings in recent years of the manifold benefits and professional value which accrue from being present.

Here is a golden opportunity to renew acquaintances with old classmates; to view all that is new from approximately 100 scientific and commerical exhibits; to be brought up to date on late developments in practice and research; to enjoy several gala social functions; to see first hand the phenomenal growth, development, and diversification of your profession.

I know that all A.V.M.A. members who can possibly arrange to do so will attend this meeting. If you are not an A.V.M.A. member, but a member in good standing of your state association, let's do you and me a big favor by filing an application for membership. Just direct a postcard or letter to the A.V.M.A., Floor 15, 600 S. Michigan Ave., Chicago, Ill.,

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expressing your desire to become a supportive member. They will follow through.

Then, come to the Minneapolis meeting and join with the 72% of all veterinarians in America who are thus actively contributing to the forward march of veterinary medicine.—*A. H. Quin, president, American Veterinary Medical Association.*

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Joint Anniversary and Dedication Ceremonies at Kansas State College

Formal dedication of the Dykstra Veterinary Hospital, a handsome new facility of the Kansas School was held in the auditorium of the new building on June 2, in conjunction with celebration of the Golden Anniversary of the conferring of degrees on graduates in Veterinary Science authorized by the State Board of Regents in 1905. The D.V.M. degree was conferred first on a group of seven young men in 1907. Since its authorization, 1,618 students have completed requirements for the professional degree.

Dr. W. A. Hagan, dean, New York State Veterinary College, one of the principal speakers at the special program of observance stated that despite significant advances in veterinary medicine during the past half century, greater accomplishments can be expected. He pointed out that there are fewer veterinary schools today than were operating in 1905, but that more important is improved public acceptance and appreciation of the profession. All of the 17 modern schools in the United States have completed or are planning new and enlarged facilities for teaching and research in an effort

Dr. C. A. Brandly

Brig. Gen. W. O. Kester, U.S.A.F.

Reflections on the early beginnings of veterinary education at Kansas State College are exchanged by (l. to r.) Dr. W. A. Hagan, KSC '15, Dean of the New York State Veterinary College, Dean Emeritus R. R. Dykstra, Dr. E. F. Kubin, KSC '09, McPherson, Ks., and Dean E. E. Leasure.

Brig. Gen. E. W. Young, V.C., U.S.A.

to give the best possible service to the livestock industry and the general public.

Dr. Floyd Cross, dean, School of Veterinary Medicine, Colorado A. and M. College and president-elect of the A.V.M.A., program speaker, expressed the opinion that regardless of the illustriousness of past accomplishments at Kansas State College that the best years are the 50 just ahead.

Highlighting the joint ceremonies, President James A. McCain referred to the leadership furnished by the School during the long service tenure of Dean Emeritus R. R. Dykstra. Under his 29 years of administration of the School, tremendous progress in both instructional and research programs was made. He said, "It is eminently fitting that the new veterinary hospital bear his name and thereby become a permanent memorial to his contributions."

Distinguished Service Awards were presented Dr. C. A. Brandly, class of 1923, now chairman of the Department of Veterinary Science, University of Wisconsin, Madison; Brig. Gen. E. W. Young, class of 1925, chief of the Veterinary Corps, United States Army, Washington, D. C.; and Brig. Gen. W. O. Kester, class of 1931, chief of the Air Force Veterinary Service, Washington, D. C.

All three recipients of the award, the first given by the School, participated in observance of the gala occasion for celebration and on the program of the 17th Annual Conference for Kansas Veterinarians that followed on succeeding days.

Others appearing on the program included Hon. John B. McCuish, Lieutenant Governor of Kansas, Lester McCoy, representing the State Board of Regents, and Dr. E. F. Kubin, member of the graduating class in veterinary medicine in 1909 and Dean E. E. Leasure, of the Kansas School.

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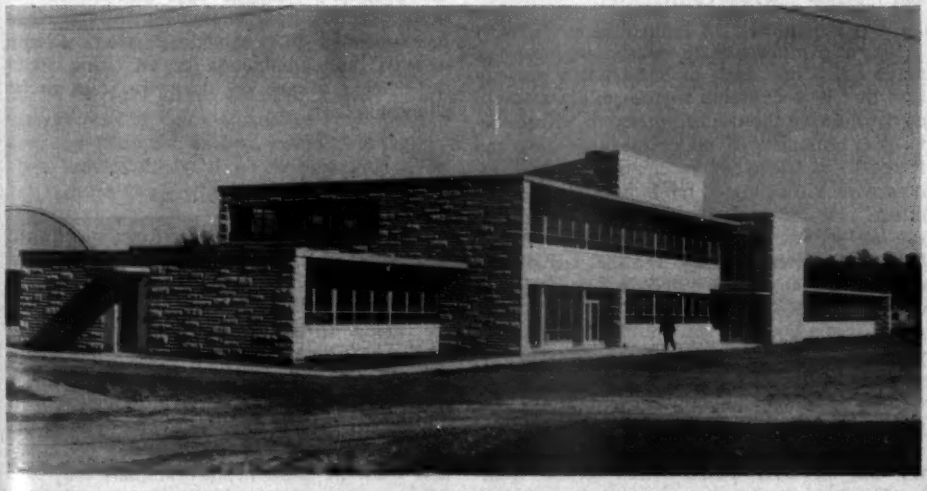
It was expected that with the increased rate of blood-testing cattle for detection of brucellosis that the national low incidence rate of 2.5% would tend to rise. This has not been the case. Expanded testing procedures reveal a steady 2.5% incidence. Even this relatively low figure is responsible for an estimated annual loss of $45,000,000.



Dykstra Veterinary Hospital — Kansas State College

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PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

Incidence of Antrophic Rhinitis Greater

Reports are being received in increasing numbers that atrophic rhinitis of swine appears to be on the increase and is now quite generally prevalent in swine breeding and raising areas. In this connection, it was informative to hear a progress report made by Switzer (Veterinary Medical Research Institute, Ames, Ia.) during the 58th annual session of the U. S. Livestock Sanitary Association, that contact between an infected sow and her litter is not absolutely necessary for development of the condition in the latter. It was reported that penning infected sows on one side of an indoor 3½ foot high solid block masonry partition, and the artificially-nursed baby pigs on the other, did not entirely prevent contamination of the latter. On the other hand, a 30 foot neutral lane between noninfected sows and their pigs, and infected pigs prevented spread. Because of these facts, it is suggested that infection of pigs is not a matter of direct contact; rather it appears that exposure of clean animals to the nasal spraying of the infected ones is the means of transmission.

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Comments on Hog Cholera Vaccination

We were informed by a veterinarian who has made a life-time study of hog cholera prevention that it is desirable to wait at least seven days following the use of antiserum before the virus is administered under the procedure referred to as "delayed" vaccination method, as otherwise virus has a minimum immunizing effect. He indicated that, in his opinion, the use of serum and virus before weaning is better than after weaning, and that tissue vaccine (BTV) and other killed or modified vaccines are least successful when the animal already has a measure of immunity. Modified virus vaccine administered to sows immediately prior to breeding, or shortly thereafter, frequently is said to be responsible for pigs deformed at birth. Three states including Wyoming, Tennessee, and Alabama do not permit the use of live, potent virus within their borders.

Papillomatosis

Cutaneous papillomatosis of cattle and other animals may, in the light of our present knowledge, be regarded almost as a self-limiting disease. This tentative conclusion seems warranted when practitioners report that the removal of a few of the smaller growths by traction, as practiced on cattle, and for oral papillomas in dogs, is followed frequently by spontaneous disappearance of the remainder. The Nebraska Agricultural Experiment Station states that results following the use of wart vaccines have been erratic, and should be examined critically because of the self-limiting nature of the disease. In other words, the disappearance of warts following the use of the vaccine may be simply coincidental.

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Kidney Worms

The swine kidney worm (*Stephanurus dentatus*), according to reports from packing houses can not be considered a southern states only problem, as formerly, because the parasite is found at slaughter in swine originating in states as far north as Nebraska. No form of medicinal treatment has been found to be effective in the prevention or elimination of this parasite. Since its eggs and larvae are susceptible to direct sunlight and drying, it is recommended that sunlight, drying, pasture rotation, and elimination of all swine about three years of age or older are steps to be advocated.

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Salmonellosis

Bacteriologists say that there are more than 100 types of Salmonella microorganisms that unfavorably affect the gastrointestinal tract of those persons involved. This, in turn, involves the blood stream; sometimes with a most severe systemic reaction. The usual incubation period is from a few to 72 hours. The house fly is a mechanical carrier, and domestic fowl are apparently the chief reservoirs of these organisms. Meat products for human consumption must be from healthy animals only and there must not be contamination by flies.

VETERINARY NUTRITION

MORRIS ERDHEIM, D.V.M.
Chicago, Illinois

Introduction

It is significant that one of the leading veterinary publications should start a new department on veterinary nutrition at this time. This act measures another notch in the growth and development of VETERINARY MEDICINE which is now celebrating its 50th anniversary of publication. It also indicates that the editor whose interest in nutrition goes back to his days in practice, is among those who recognize that veterinary nutrition as a specialty in our profession has come of age.

It is the aim of this Department to present practical information on nutrition which will help veterinary practitioners in their day to day activities with problems that develop in the field. Your questions, comments, and criticisms are invited.

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American Association of Veterinary Nutritionists

There are now a large number of veterinarians who earn their living by activities in the nutrition field. Some are in colleges and experiment stations doing research. Some work for feed companies—on a full time or part time basis as consultants. Others work for suppliers to the feed industry, like manufacturers of vitamin and mineral products used for the fortification of feed.

As a result of a series of meetings held during the year, an organization of these veterinarians now is being formed. That there is a strong need for such a group, was agreed upon universally by those participating. The key reasons given were:

1. Recognition of nutrition as a veterinary specialty.

2. Organization of our thinking on subjects of mutual interest with the feed industry.

3. Giving guidance based on our collective thinking on problems such as "medication of feed" to serve the best interests of the livestock industry in which both the feed industry and the veterinary profession are interested.

In November of last year, the Committee on Nutrition of the A.V.M.A. appointed a subcommittee to implement the organization of the American Association of Veterinary Nutritionists.

The A.V.M.A. office is coordinating the meeting places and dates for the sectional meetings to be held during the A.V.M.A. convention in Minneapolis. This group will meet Monday, August 15, at 4:30 p.m. in the Spanish Room of the Radisson Hotel. Any veterinarian interested in nutrition—research or commercial—is invited to attend.

The Committee would appreciate hearing from you. Please direct comments, suggestions and names of veterinarians who might be interested to any of the three members of the subcommittee listed below:

Dr. W. D. Pounden
Ohio State Agricultural
Experiment Station
Wooster, Ohio

Dr. R. E. Lubbehusen
Purina Mills
835 S. 8th Street
St. Louis, Mo.

Dr. M. Erdheim, Chairman
Dawe's Laboratories, Inc.
4800 South Richmond Street
Chicago 32, Ill.

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Optimal Protein Levels for Baby Pigs

Work at Minnesota has revealed that baby pigs make excellent gains on a 20% protein formula. A 16% formula was below the needs for best growth.

The addition of 40 gm. per ton of antibiotics or 120 gm. of arsanilic acid caused an average three to eight lb. increase in weight of the eight-week-old pigs.

When given a choice, pigs preferred unflavored feed. Test feeds contained anise-molasses, a molasses-fortifier, and two different "fruit" flavors. However, they did go for the feed with the highest level of sugar when offered test rations containing 10%, 5%, and no sugar.

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Hogs following cattle fed female-hormone-like substances in Purdue tests, show mammary and genital stimulation. Open gilts exhibited teat development and enlarged vulvae.

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POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Milkweed Poisoning

Milkweed poisoning has been reported in chickens and turkeys on a few occasions, when milkweed has been the only succulent feed available. Campbell (Calif. Dept. Agric. Bul., 20 (8): 28, 1931) reported losses in chickens following eating of narrow-leafed, whorled milkweed (*Asclepias mexicana*) and Stiles (*Poultry Sci.*, 21:263, 1942) reported losses in turkey poults that ate another species of whorled milkweed (*A. galiodes*).

Symptoms vary considerably, depending on the quantity of toxic plants eaten. Lameness, followed by complete loss of muscular control, with twisting of the neck and drawing backward of the head are common symptoms. The symptoms do not appear to be due to a true paralysis but rather to an over stimulation of motor nerve centers with complete lack of coordination. Some paralyzed birds may recover. No characteristic lesions are found on autopsy. Removal of the cause is the only preventive measure known. No effective treatment has been reported.

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Research on gassing turkeys with carbon dioxide (CO_2) to render them unconscious before they enter the processing line is under way at Texas A. & M. College. Preliminary results indicate that this method is feasible.

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Light-plumaged turkeys and broilers may some day predominate among the meat-type birds produced for market in the United States, according to USDA scientists at the Agriculture Research Center, Beltsville, Md. (*Agric. Res.*, Mar. 1955, p. 15). The trend toward light-plumaged fowl has resulted from a consumer preference for a clean, appetizing-looking carcass, and by processor's preference for a bird that is easier to dress.

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Griffith, Leary, and Fenstermacher (*Am. Jour. Vet. Res.*, 15:298, 1955) have recorded a new species of tapeworm (*Cyathostoma bronchialis*) in domestic geese in North America. A review of the literature on this subject is given in this report.

Aureomycin fed at the rate of ten parts per million in starting-growing mashes had no effect upon the moistness, tenderness, or flavor of cooked Beltsville White turkey-fryer-roasters and 26-week-old roasting toms, according to Swickard (*Poultry Sci.*, 32:726, 1953). In the same reference, Swickard states that mashes which contained 5% menhaden fish meal and 1% fish oil produced off-flavors. She concluded that the amounts of fish products used in mash in her experiments were unsuitable for production of high quality turkey fryer-roasters.

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Finely ground mash fed to turkey poults as the sole or maximum part of the diet may cause the so-called "curled-tongue" of poults according to Bragg (*Poultry Sci.*, 32:294, [Mar.], 1953). Curled tongue is a condition where the tongue folds backward on its upper surface causing the poults to drool. It apparently is not a deficiency disease.

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Time of Feed Passage Through Fowl

Food passage through turkeys and chickens was studied by Hillerman, *et al.* of the University of California (*Poultry Sci.* 32:334, [Mar.], 1953). Food passed through the alimentary tract of laying turkey hens in three hours and 13 minutes and in non-layers in four hours and 16 minutes. In old turkey hens, the time was three hours and 52 minutes in contrast to two hours and 29 minutes in young hens. Age appeared to be a more important factor than production. Chicken hens were similar to turkey hens in their feed passage rate.

Environmental temperatures of 60 F. and 90 F. caused little difference, but penicillin in the feed caused a slight retardation of the passage rate.

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Chickens need twice as much water for their weight as beef cattle, hogs or sheep.—*Poultry Tribune*, Jan. 1955.

BOOK REVIEWS

Books reviewed in this department and any other books, if available, may be obtained by remitting the published price to the Book Department, Veterinary Medicine, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

PET DOG BOOKS, 64 pages, illustrated. All-Pets Books, Inc., Fond du Lac, Wisc. —Price $1.25.

A book on each of the 21 most popular breeds of dogs, Care of the Aging Dog, and Lovable Mongrel are included in a series of paper-bound 24-page books (5¼" x 7½") with cover designs by Lawrence E. Megargle and text illustrations by a number of well-known artists.

Each of these small books contains chapters on the history of the breed, feeding, exercise and care, growing, training, showing, breeding, and health and disease. They are intended for the dog owner who wishes to give his pet proper care and thereby realize maximum enjoyment of ownership of a healthy and well behaved pet. Technical material in each has been prepared by a veterinarian or under the supervision of a qualified practitioner. In these chapters variously entitled Health Problems, The Health of Your Dog, Health and Disease, et cetera, authors have emphasized the role of the veterinary practitioner and his preparations to share the responsibility of raising a puppy. Most of these deal with preventive medicine including vaccine recommendations and brief comments in regard to parasite control, accidents, poisoning, burns, wounds, et cetera similar to contents of some household medicine texts. All of this material is free of technical nomenclature and should serve admirably to guide the new owner and encourage his making acquaintance early with a veterinarian prepared and equipped to assist him in keeping his puppy disease-free.

Of special merit is Care of the Aging Dog by Dr. C. E. DeCamp, well-known national authority and consultant on small animal disease problems. Doctor DeCamp has handled subject matter with good taste and sound recommendations with emphasis on management and feeding.

Lovable Mongrel is the second of the series which does not deal specifically with any breed but follows the adopted form of material presentation of the breed books. Illustrations in this by Lou Darvas are noteworthy.

Any or all of these little books are of interest to practitioners as source material to refer clients. Practitioners are extended a discount of 25% if sample library copies are desired or for gifts to new dog owners. A catalog of these and other pet books also is offered by the publishers who have agreed to provide as many of these as desired upon request.

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FOREIGN ANIMAL DISEASES: THEIR PREVENTION, DIAGNOSIS, AND CONTROL. Report of Committee of the United States Livestock Sanitary Association, 270 pages, illustrated. Copies may be purchased from the Secretary-Treasurer, U. S. Livestock Sanitary Association, 1 W. State Street, Trenton 8, N. J. —Price $1.00; two to 50 copies, 75c each; 51 copies or more, 60c each.

A Committee, under the chairmanship of Dr. Frank A. Todd, special assistant to the administrator, Agricultural Research Service, USDA, of the U.S.L.S.A., was charged with the responsibility of studying the threat of foreign animal diseases that might enter the United States and Canada either by accident or by deliberate acts of sabotage. The paper bound book of 270 pages, covering 28 such diseases, six of which are transmissible to man, constitutes this committee's report. All of these plagues are established in various parts of the world. Their seriousness ranges from slight debilitation and little economic loss to decimation of livestock population in given areas. Almost all are foreign to our country and classified as exotic.

Information is presented in concise form to enhance its value to practitioners and regulatory officials. Much of the contents has been collected only recently and some is based on personal experiences and observation of authors and is not available elsewhere. It is for these reasons that practicing veterinarians, public health officials, teachers, students, and especially new graduates are encouraged to avail themselves of a copy for careful reading and reference.

Information on each disease includes: (1) Identification, (2) symptoms, (3) pathogenic changes, (4) diagnosis, (5) prognosis, (6) epizootiology, (7) control, (8) public health aspects, and (9) references. Also included are charts giving salient points of each disease, the

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approved diagnostic procedures, and control measures. There is also information on the methods of reporting, instructions for obtaining aid in confirmation of diagnosis, for setting up quarantines and instigating an appropriate control program. The report also deals with insect vectors and the part they play in spreading certain specific diseases.

Though rigid inspection procedures are in force to prevent accidental introduction, these and other foreign animal diseases are a continuing threat to the livestock industry and public health in the United States, The fact that they may be used effectively in the event of biological warfare underscores the need for increasing our knowledge of these diseases in the countries where they exist at present.

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THE NATURAL HISTORY OF MAMMALS, by *Dr. Francois Bourliere*. Translated from the French edition. 363 pages, numerous illustrations. Alfred A. Knopf, New York publishers, 1954. Price $5.

Books on natural history tend to be dull reading. They traditionally begin with the Orders of Apes and Monkeys, plunge into the Carnivora, then the seals and sea lions, and so on. They present much unusually boring minutiae to the lay reader, and one rarely bothers to persevere through the Orders of Reptiles and Fish.

The Natural History of Mammals is different. Not only does it restrict itself to the most interesting members of the animal kingdom, but it is arranged in ten chapters according to certain animal traits and behaviorisms. These are: Locomotion; Food and Feeding Habits; Home, Territory, and Home Range; Defense and Protection; Sexual Life and Reproduction; Development and Longevity; Migrations; The Social Life of Mammals; Mammals and Their Environment; and The Structure and Dynamics of Natural Populations.

One might think that this sort of arrangement would lead to confusion—for instance, that such obviously different locomotive systems as those of the horse and the bat would be considered in the same chapter. This is actually the case; but rather than leading to confusion, this unique arrangement allows the reader to grasp certain parallels and relationships that might otherwise be lost.

Throughout his book, Doctor Bourliere, a French physician and associate professor of medical biology at the University of Paris, emphasizes the interplay between animals and their environments, and areas wherein research would be valuable. This is a most thoughtful book for those interested in the interpretation of animal acts and actions.—*Kenneth B. Haas, D.V.M.*

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THE MAMMARY GLAND by *Charles W. Turner, Ph.D.*, Professor of Dairy Husbandry, College of Agriculture, University of Missouri, Columbia. 389 pages, 205 illustrations. Lucas Brothers, Columbia, Mo., publishers, 1951.—Price $10.

Material contained in this book was assembled first in 1933 and served as a basis, at that time, for discussions in a course named Milk Secretion offered students in dairy husbandry. Since, it has been enlarged and published by multilith process for reference material.

The present edition includes considerable material published during the past 12 years. Scope of the subject has been enlarged though it is concerned primarily with anatomy of the udder of cattle and other domestic animals. The need is justified by preface introduction by the author. "The greatest agricultural industry of the United States is based upon the secretion of milk by dairy cattle."

The book is divided into three sections. Part I deals with gross anatomy of the udder of cattle and part II with histology. Part III is devoted to comparative anatomy of the mammary glands of hoofed animals other than cattle. By this arrangement an analytical study is made beginning logically with the exterior then the interior of the gland itself, followed by discussion of each of the body systems that influence glandular physiology and the secretory process. Little space is given to diseases in the chapter on Pathologic Anatomy. The influence of mastitis on structural changes and functional activities and management practices to avoid infection is essential in a work of this kind. The author gives no direction or makes any recommendations for treatment.

As a comprehensive study, this book should serve those practitioners having extensive dairy practices, even though the text was not intended for this group of readers. It is information, detailed precisely and fully documented.

Reproduction has been done by process lithography but is clear and readable. References are listed after each chapter and are extensive.